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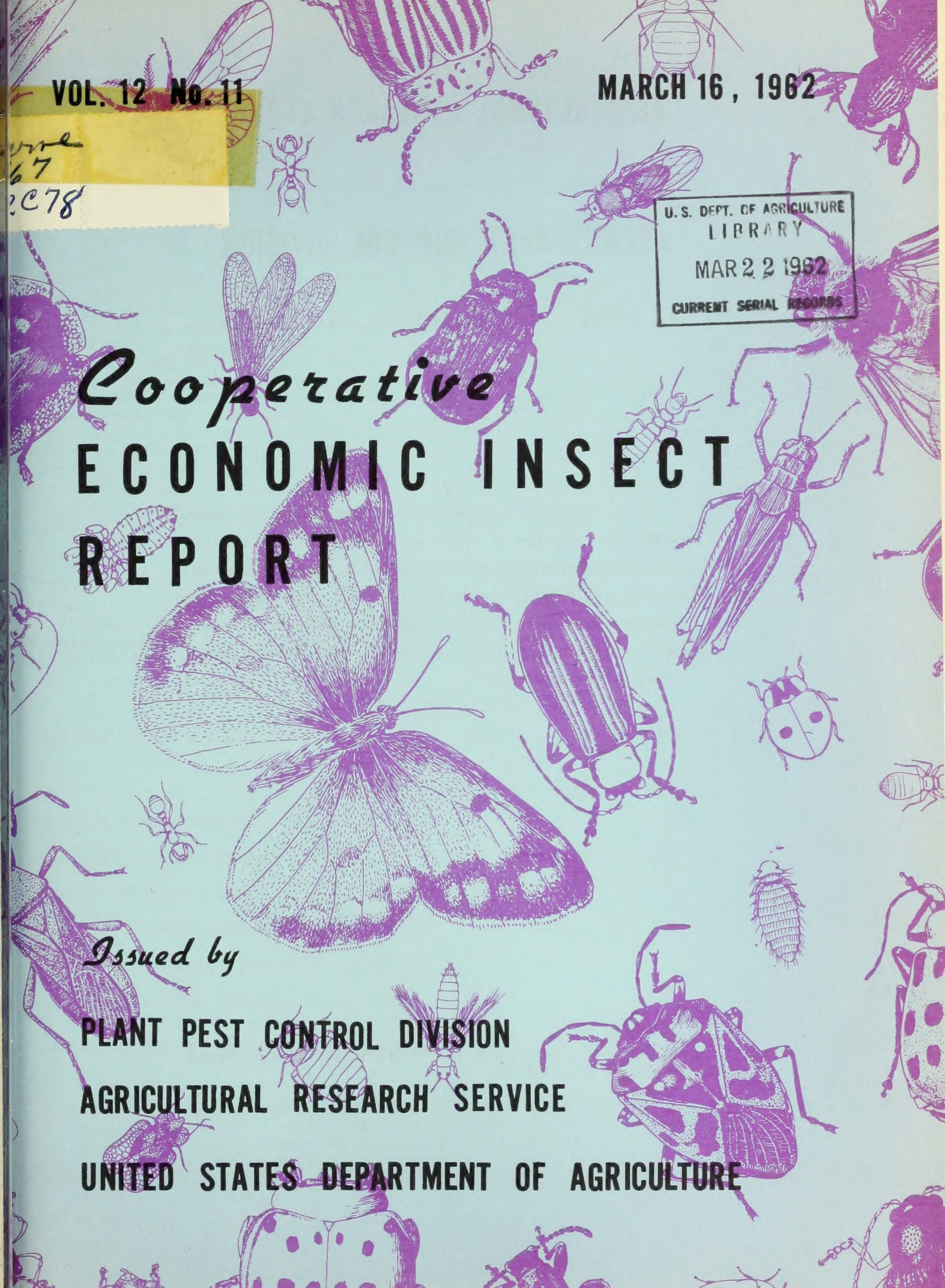

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MARCH 16, 1962

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Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
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United States Department of Agriculture
Washington 25, D. C.

Volume 12 March 16, 1962 Number 11

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG reported light to moderately heavy in small grain in Curry, Roosevelt and Quay Counties, New Mexico. SOUTHWESTERN CORN BORER survival survey in Arkansas showed a wide variation between areas in the State; all larvae in corn stalks in Roosevelt and Curry Counties, New Mexico, found dead. Unspecified CUTWORMS causing light to heavy damage to flax in Guadalupe County, Texas; and PEA APHID increasing rapidly in central and southwest Arizona alfalfa. (p. 193). Infestations of an alfalfa weevil (*Hypera brunneipennis*) continue very heavy on alfalfa in areas of Arizona and light larval infestations appearing in Riverside County, California. ALFALFA WEEVIL larvae appearing in eastern and central Tennessee and light defoliation of alfalfa noted in Oconee County, Georgia. CITRUS PESTS generally below normal in Florida, but CITRUS RUST MITE expected to increase in March and move out on new foliage. (p. 194). SOUTHERN PINE BEETLE heavy to severe on 90,000 acres of pines in Hall County, Georgia; critical situation could develop. (p. 195). SHEEP KED heavy on sheep in Rio Grande County, Colorado. (p. 196).

Forecasts of Insect Conditions

Brood II of PERIODICAL CICADA expected to appear in New Jersey in May and June; egg-laying damage to young nursery and orchard trees may be severe. (p. 194). A major outbreak of LINDEN LOOPER may occur in Connecticut in 1962. PUSS CATERPILLAR is potentially a problem in Mobile County, Alabama. (p. 197).

Insect Detection

BEAN LEAF ROLLER reported for first time in Delaware. (p. 195).

Special Reports

Hawaiian Insect Notes. (p. 198).

Interceptions of Special Interest at U. S. Ports of Entry. (p. 199).

Summary of Insect Conditions - 1961 (continued)

TRUCK CROP INSECTS - (p. 200).

TOBACCO INSECTS - (p. 223).

COTTON INSECTS - (p. 225).

Summary of Insect Conditions in Hawaii - 1961 (corrected). (p. 233).

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Reports in this issue are for week ending March 9, unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 12

The week's weather, typical of March, was stormy with generally rising temperatures and widespread light to locally heavy precipitation as storm systems moved rapidly across the country.

The week was much colder than the previous week in the Southeast where weekly averages were 6° to 12° below normal, but was generally 6° to 12° warmer in the remainder of the Nation even though weekly averages were 15° below normal in parts of the northern Great Plains. The coldest weather occurred during the first half of the period when subzero minima persisted in the North Central Interior and freezing extended into the central and eastern gulf coastal areas. Freezes damaged fruit, tung nuts and beans in Louisiana on the 5th and 6th, and caused some additional crop damage in the Everglades region of Florida on the 8th.

Precipitation was very light in the Florida Peninsula, gulf coastal areas, the extreme Northeast, northern Minnesota, and most of the Great Plains, but generally exceeded 0.50 inch elsewhere. Heaviest amounts, exceeding 2 inches, were reported from middle Tennessee, northern portions of Alabama and Georgia, South Carolina, and along the middle Atlantic coast, most of it falling during the weekend. Precipitation in the Far West further improved the irrigation water outlook.

By far the most important storm was a vast low pressure system centered off the middle Atlantic coast on the 6th and 7th. The storm, generating winds up to 85 m.p.h., and waves up to over 40 feet in height near the center, battered installations along the coast from Florida to New England. Damage is expected to total hundreds of millions of dollars. Few hurricanes have caused as much or as widespread damage as this storm which is already being referred to, and properly so, as the "Great Atlantic Storm."

Another storm during the weekend brought heavy snowfall to much of the North Central Interior. Several inches were reported in north central Kansas, up to 10 inches in southeastern South Dakota, 4 to 10 inches in Minnesota, and up to a foot in northern Wisconsin. The snow cover at the end of the period was still heavy for so late in the season in the northern Great Plains, the upper Mississippi Valley and Great Lakes region.

Heavy snow fell in the middle Atlantic Coastal States during the Atlantic storm on the 6th and 7th. Falls ranged up to 30 inches in the Virginias and 1 to 3 inches was still on the ground in central Virginia at the end of the period. Snow covered large areas of North Carolina on 3 to 5 days, and extended to the coast on 2 days, a very unusual event in North Carolina during March, perhaps unprecedented. Considerable snow also fell in South Carolina and up to 7 inches in northern Georgia. (Summary supplied by U. S. Weather Bureau).

WEATHER BUREAU 30-DAY OUTLOOK

MID-MARCH TO MID-APRIL 1962

The Weather Bureau's 30-day outlook for mid-March to mid-April calls for continued below normal temperatures over most of the Nation, except for near to slightly above normal temperatures from the Great Lakes eastward and also in coastal areas along the Gulf of Mexico and Pacific Northwest. Precipitation is expected to exceed normal over most areas except for subnormal amounts over the Southern Plains and Pacific Northwest and near normal amounts in the far Southwest.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - OKLAHOMA - Generally at noneconomic level throughout State. One field in Grandfield area had up to 20 per linear foot; all other counts below 10 per linear foot. (Okla. Coop. Sur.). TEXAS - Continues noneconomic; highest counts 10-15 per linear foot in some panhandle areas. (Texas Coop. Rpt.). NEW MEXICO - Light to moderately heavy in small grain fields in Curry, Roosevelt and Quay Counties; average counts per linear foot were 20-30 in Clovis area, 4-10 in Portales area and 5-10 in House area. One field in Bethel had 100 plus per linear foot. (N. M. Coop. Rpt.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Counts 40-50 per linear foot in field in Grandfield area, with counts up to 25 per linear foot noted in scattered south central areas. Other counts in southwest and south central areas considerably lower. (Okla. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Light in small grains; 1-8 per linear foot in northwest and 1-2 in south central area. (Okla. Coop. Sur.). ARIZONA - Light to medium on barley in some central and southwestern areas, but generally much lighter than in previous years. (Ariz. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum granarium) - OKLAHOMA - Light in small grains; 3-8 per linear foot in northwest, 0-2 in southwest and 2-3 in south central area. (Okla. Coop. Sur.).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - ARKANSAS - Surveys to determine survival of overwintering larvae underway. This is of special interest since the State has had the lowest temperatures this winter than at any other time since this pest became established in the State. Survival shows a wide variation between areas. Percent survival to March 10 is listed by areas as follows: northwest - 12.9; northeast - 6.1; southwest - 57.9; west central - 43.8. Survival figures reported in CEIR 12(6):69 and CEIR 12(10):161 included in this tabulation. (Ark. Ins. Sur.). NEW MEXICO - All larvae in corn stalks in fields in Roosevelt and Curry Counties dead. (N. M. Coop. Rpt.).

CUTWORMS - OKLAHOMA - Light to heavy populations, probably Chorizagrotis auxiliaris, on wheat in northwest, 1-10 per linear foot. Lighter populations in southwest (up to 0.5 per linear foot) and south central areas. (Okla. Coop. Sur.). TEXAS - Unspecified species causing light to heavy damage to flax in widespread areas of Guadalupe County. (Texas Coop. Rpt.; Massey).

CRANE FLIES - CALIFORNIA - Tipula simplex larvae caused severe damage to rangelands in Tulare County during February; adults currently emerging in Exeter area, with considerable mating and oviposition occuring; controls applied in late February apparently preventing further damage. Tipula sp., not simplex, light in rangeland forage in Academy, Fresno County. (Cal. Coop. Rpt.).

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Light on wheat in Kiowa County; 0-5 per linear foot. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light, scattered populations observed on wheat in south central area. (Okla. Coop. Sur.).

PEA APHID (Macrosiphum pisi) - OKLAHOMA - Light to medium, up to 75 per square foot, on alfalfa in south central area; lighter populations observed in southeast. (Okla. Coop. Sur.). ARIZONA - Infestations increasing rapidly in central and southwest area alfalfa. (Ariz. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OKLAHOMA - Nonexistent in alfalfa in southeast. One field found infested in south central area; counts 6-8 per linear foot. (Okla. Coop. Sur.). COLORADO - Populations averaged 2-3 per alfalfa crown during November, December (1961) and January (1962) in Arkansas River Valley. None found alive in February. (Schweissing).

AN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Counts in some central area alfalfa average 100-300 larvae per 100 sweeps. Yuma County infestations continue very heavy, with severe damage present in many fields. (Ariz. Coop. Sur.). CALIFORNIA - Light larval infestation appearing on alfalfa in Arlington, Riverside County. (Cal. Coop. Rpt.).

ALFALFA WEEVIL (Hypera postica) - GEORGIA - Light defoliation of alfalfa noted in Oconee County. (Johnson). TENNESSEE - Larvae appearing in eastern and central areas; much earlier than in 1961. Latest cold stopped egg hatch, but warming will resume egg hatch. Spring treatments will soon be needed. (Mullett). COLORADO - Adults not found to March 9 in Arkansas River Valley. (Schweissing).

CLOVER LEAF WEEVIL (Hypera punctata) - OKLAHOMA - Light, scattered larval populations noted on alfalfa in south central area; 0-4 per square foot. (Okla. Coop. Sur.).

LEAFHOPPERS - OKLAHOMA - Unspecified species common on alfalfa throughout south central (10-15 per square foot) and southeast areas. (Okla. Coop. Sur.).

FRUIT INSECTS

PERIODICAL CICADA (Magicicada septendecim) - NEW JERSEY - Brood II expected to make appearance in late May and June. Egg-laying damage to young, transplanted trees in nurseries and orchards, and even to older trees, can be severe. (Ins.-Dis.-Weed Newsltr., Mar. 6).

FLATHEADED APPLE TREE BORER (Chrysobothris femorata) - NEW MEXICO - Killed young trees in orchard near Belen, Valencia County; larvae often 4-8 per tree. (N. M. Coop. Rpt.).

Citrus Insect Situation in Florida - End of February - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 52 percent of groves (norm 62 percent); 36 percent economic (norm 38 percent). Population slightly below average, but will increase during March and move out on the new foliage. Highest districts are west coast, Bartow, Brooksville and Orlando. CITRUS RED MITE (Panonychus citri) infested 28 percent of groves (norm 65 percent); 9 percent economic (norm 36 percent). Statewide population will increase but will continue to be far below normal. Highest district is west coast. TEXAS CITRUS MITE (Eutetranychus banksi) infested 20 percent of groves; 2 percent economic. Population will remain low in all districts. FLORIDA RED SCALE (Chrysomphalus aonidum) infested 42 percent of groves (norm 48 percent); 5 percent economic (norm 5 percent). No increase is expected. Highest district is ridge. PURPLE SCALE (Lepidosaphes beckii) infested 82 percent of groves (norm 79 percent); 12 percent economic (norm 15 percent). Populations becoming more numerous but are approaching the adult stage which is susceptible to parasite attack. Groves with moderate to heavy infestations should be examined at this time. Highest districts are ridge, Brooksville and Orlando. BLACK SCALE (Saissetia oleae) infested 35 percent of groves (norm 15 percent). Population still above normal but infestations will not reach destructive level within the next month. A few APHIDS are starting to appear and SIX-SPOTTED MITE (Eotetranychus sexmaculatus) still is scarce. (Simanton, Thompson, Johnson (Citrus Exp. Sta., Lake Alfred), Mar. 2).

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Light infestations on dooryard citrus in McFarland and Bakersfield, Kern County. (Cal. Coop. Rpt.).

MELON APHID (Aphis gossypii) - CALIFORNIA - Medium populations appearing on orange trees in Pauma Valley, San Diego County. (Cal. Coop. Rpt.).

TRUCK CROP INSECTS

HARLEQUIN BUG (Murgantia histrionica) - TEXAS - Scattered infestations present in home gardens in Guadalupe County, south central area; damage reported light to heavy. (Texas Coop. Rpt.; Massey).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Light on cabbage in Colquitt County. (Johnson).

APHIDS - TEXAS - Unspecified species appearing on cabbage in moderate to heavy numbers in widespread area of Guadalupe County. (Texas Coop. Rpt.; Massey).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Medium to heavy in central and southwest area safflower and sugar beets. Light infestations a problem in some lettuce. (Ariz. Coop. Sur.). TEXAS - Populations of over 100 per plant continue to cause severe damage to spinach in Zavala County. (Harding).

BEAN LEAF ROLLER (Urbanus proteus) - DELAWARE - Adult collected in Newark, New Castle County, on September 22, 1961, by C. T Dickerson; a new State record. (Burbutis).

CUTWORMS - TEXAS - Unspecified species causing damage ranging from light to heavy on garden onions in Guadalupe County. (Texas Coop. Rpt.; Massey).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light to heavy on tobacco in the plant bed in Colquitt, Cook, Berrien, Tift, Worth, Irwin and Coffee Counties. (Johnson).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light on tobacco in the plant bed in 7 counties mentioned in vegetable weevil note. (Johnson).

GREEN PEACH APHID (Myzus persicae) - GEORGIA - Light on tobacco in the plant bed in 7 counties mentioned in vegetable weevil note. (Johnson).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - FLORIDA - Two larvae and 5 pupae collected from 350 bolls of wild cotton at Cape Sable, Dade County, on February 25 and 8 larvae and one pupa collected from 175 bolls and 5 blooms of wild cotton on Plantation Key, Monroe County, on February 26. (PPC). One larva and 2 pupae collected from 92 bolls and 41 blooms of wild cotton at Islamorada, Monroe County, on March 2. Det. W. Breidenbach. (Creamer).

SPIDER MITES - ALABAMA - Large hibernating populations of undetermined species observed on recent survey of fence rows and woodland adjoining cotton fields in Limestone County. (Buttram, Mar. 2).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - GEORGIA - Heavy to severe on 90,000 acres of pines in Hall County. All stages present and could develop into a critical situation. (Smith, Blassingame).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - ALABAMA - Heavily infesting 98 percent of small pine nursery seedlings in Mobile County; 10 percent infested with Tetralopha robustella and Neodiprion lecontei. (Seibels, Mar. 2).

Lepidopterous Insects in Connecticut - GYPSY MOTH (Porthetria dispar) continued to increase in abundance in 1961. Some 58,000 acres were heavily infested and 45,716 acres were treated under the provisions of the statutes. Noticeable defoliation was found on 15,775 untreated acres, with 4,200 acres being defoliated 50 percent or more. Scouting, which was not complete as of March 1, 1962, has disclosed 115,375 acres infested sufficiently to cause defoliation in 1962. This is mostly west of the Connecticut River and inland. Acceptances for spraying have just started and, it is estimated, that about half of this area might be sprayed. CANKERWORMS and LINDEN LOOPER (*Erannis tiliaria*), often in mixtures, were injurious on about 37,500 acres in 1961 and 1,348 acres were defoliated more than 50 percent. Some 1,500 acres were sprayed by airplane in 1961 for what was labelled CANKERWORMS. The flight of LINDEN LOOPER in the fall of 1961 suggests a major outbreak in 1962. There will also be some CANKERWORMS in 1962. The infestation of these latter mentioned pests is in the same area as the GYPSY MOTH and observations in 1961 indicated that GYPSY MOTH lost out in competition with these pests. (Turner, Mar. 1).

LONG-HORNED BEETLES - COLORADO - Larvae and pupae found in lumber in Adams County. (Hansbarger, Lawson).

COCCIDS - CALIFORNIA - *Aonidiella aurantii* medium locally on rose bushes in Wheeler Ridge and generally light on euonymus at Bakersfield, Kern County. *Asterolecanium bambusae* heavy on bamboo locally in Riverside, Riverside County. *Epidiaspis piricola* medium on Christmasberry (*Photinia arbutifolia*) and *Parlatoria oleae* light on *Fraxinus* sp. in Livermore, Alameda County, (Cal. Coop. Rpt.).

A PSYLLID (*Psylla uncatoides*) - CALIFORNIA - Adults light on *Acacia melanoxylon* in Livermore, Alameda County. This pest has been serious on acacia the past few years. (Cal. Coop. Rpt.).

A THORNBUG (*Umbonia crassicornis*) - FLORIDA - Light to moderate on calliandra at West Hollywood on February 27 and at Davie on February 28 in Broward County (McLean, Dowling), and at Bradenton, Manatee County, on March 2. (Frederic).

APHIDS - FLORIDA - *Myzus persicae* severely infesting 200 pittosporum plants at Tampa, Hillsborough County, on January 2 (a new host record for the Division of Plant Industry) (Hale); lightly infesting chrysanthemum at Alva, Lee County, on January 29 (Walsh); and light on chrysanthemum at Sanford, Seminole County, on February 8 (Youtsey). *Aphis spiraecola* severely infesting *Jacaranda acutifolia* at Miami, Dade County, on February 5. (McMillan, McFarlin). *A. gossypii* moderate on 500 loquat plants at Apopka, Orange County, on January 29 (Youtsey) and on new leaves of seagrape at Davie, Broward County, on February 28 (McLean). *A. sambucifoliae* severely infesting elderberry at Crescent City, Putnam County, on February 8 (Graham); and *A. coreopsidis* heavily infesting eastern baccharis at Bay Lake, Lake County, on January 24 (Henderson).

GRAY GARDEN SLUG (*Deroceras reticulatum*) - OREGON - Damaging spring flowers in home gardens throughout Willamette Valley. (Capizzi).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (*Hypoderma* spp.) - UTAH - Grubs numerous in backs of cattle in some herds in Loa-Bicknell area, Wayne County. (Knowlton). OKLAHOMA - *H. lineatum* populations averaged 3 per head on long yearlings in Stillwater area; counts less than one per head on animals in Marshall County. (Okla. Coop. Sur.). GEORGIA - Two of 10 animals examined in Early County infested with *H. lineatum*; 2 and 3 grubs, respectively. Emergence of grubs not complete. (Roberts, Feb. 2). Heel fly activity reported about February 25 in Tift and Thomas Counties. (Pod, Sherman, Roberts).

SHEEP KED (*Melophagus ovinus*) - COLORADO - Populations heavy on sheep in Rio Grande County. (Jenkins).

FACE FLY (*Musca autumnalis*) - WISCONSIN - Populations heavy in a home in Grant County. (Wis. Ins. Sur.).

CATTLE LICE - UTAH - Controls applied in Wellington area of Carbon County and populations very numerous in some Duchesne County herds. (Knowlton, Hassell). OKLAHOMA - Heavy infestation of Bovicola bovis on herd of yearling heifers in Marshall County; 3-6 per hair part. Activity continues throughout State. (Okla. Coop. Sur.). GEORGIA - Solenopotes capillatus light on beef cattle in Thomas and Sumter Counties; ten animals examined in Early County not infested with lice. (Roberts, Feb. 2-5).

PUSS CATERPILLAR (Megalopyge opercularis) - ALABAMA - Hibernacula heavy on willow in Mobile County; potentially a problem the summer of 1962. (Seibels, Mar. 2).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Counts 8 per head on cattle in Pushmataha County, southeast area. (Okla. Coop. Sur.).

HOUSEHOLD AND STRUCTURAL INSECTS

EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) - CONNECTICUT - Winged forms swarming in 3 different private homes in Stamford, Waterbury and Hamden. (Johnson).

BOXELDER BUG (Leptocoris trivittatus) - OREGON - Reported emerging from hibernation and of concern to homeowners in Salem area. (Pearson). UTAH - Entering homes at Corinne, Box Elder County. (Knowlton). MARYLAND - Invaded homes in Prince Georges and Baltimore Counties. (U. Md., Ent. Dept.).

BROWN-BANDED COCKROACH (Supella supellectilium) - WASHINGTON - Reported to be a serious problem in Wenatchee area. (Burts). COLORADO - Numerous in apartment in Larimer County. (Lawson).

OLD-HOUSE BORER (Hylotrupes bajulus) - MARYLAND - Larvae active in structural wood in a home at Millersville, Anne Arundel County. (U. Md., Ent. Dept., Mar. 1).

BENEFICIAL INSECTS

LADY BEETLES - OKLAHOMA - Several species light on alfalfa and wheat in southeast, south central and southwest areas. (Okla. Coop. Sur.).

DAMSEL BUGS (Nabis spp.) - OKLAHOMA - Light, scattered populations on alfalfa and wheat in south central area. (Okla. Coop. Sur.).

MISCELLANEOUS INSECTS

JAPANESE BEETLE (Popillia japonica) - CALIFORNIA - Intensive soil sifting resulted in recovery of several larvae in a limited area where heavy adult populations occurred in 1961. Due to extremely hot, dry fall and early winter, late summer chemical soil treatments have not had a chance to become effective. It is hoped that recent heavy rains will activate soil chemicals and provide control of larvae prior to normal emergence in June. (Cal. Coop. Rpt.).

A SLUG (Arion ater) - CALIFORNIA - Medium infestations continue in Crescent City, Del Norte County, as survey to delimit the infestations is made. Detection for this slug has been negative in other northern coastal counties reporting. (Cal. Coop. Rpt.).

A SLUG (Arion hortensis) - CALIFORNIA - Light populations occurring in yard of a public building in Santa Cruz, Santa Cruz County, and in soil locally in San Anselmo, Mill Valley and San Rafael, Marin County. (Cal. Coop. Rpt.).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - OKLAHOMA - Surveys in Hughes, McIntosh, Okfuskee, Okmulgee and Pittsburg Counties negative. (Okla. Coop. Sur.).

ALABAMA - First mating flights observed in Lee and Tallapoosa Counties. (Barwood, Mar. 2).

A CUBAN MAY BEETLE (Phyllophaga bruneri) - FLORIDA - Collected in Japanese beetle trap at International Airport, Miami, Dade County, on February 14. (Stephens).

CORRECTION

CEIR 12(7):85 - SLUGS - CALIFORNIA - Arion echinopus should be Arion hortensis.

LIGHT TRAP COLLECTIONS

	Pseud. unip.	Prod. ornith.	Helio. zea	Spod. exigua	Agrot. ips.	Feltia subterr.	Peri. saucia
FLORIDA							
Gainesville 2/28	6	5	1		3	26	
ARIZONA							
Mesa 2/21-28				8		38	5

HAWAIIAN INSECT NOTES

The following reports were submitted by the Hawaiian Entomological Society and were abstracted from the "Notes and Descriptions" in the minutes of the February 12, 1962, meeting.

The first shipment of a SCELIONID WASP (Telenomus basalis Woll.), an egg parasite of the southern green stink bug (Nezara viridula), was received from Australia on February 6, 1962. The shipment consisted of approximately 2,000 specimens which were released on beans on the north rim of the Old Quarry, University of Hawaii. Subsequently, 3,000 additional parasites were received and these were released at Makaha Valley, Waianae, where large adult and nymphal populations of southern green stink bug were observed on ears of corn, okra, spiny amaranth, beans and other hosts. A. basalis was sent through the cooperation of Dr. Douglas Waterhouse, Chief, Division of Entomology, C.S.I.R.O., Canberra, Australia. (C. J. Davis).

A very heavy infestation of a CONIFEROUS TWIG APHID (Cinara sp.) was observed on loblolly pine saplings at the Olinda tree nursery, Maui, on January 16, 1962. The needles of many of the infested branches were yellow and some saplings appeared to have been killed by this species. Determination was made by Dr. F. Hottes,who believed that this may be a new species. This appears to be the second twig and bark infesting aphid to become established in Hawaii. (C. J. Davis).

INTERCEPTIONS OF SPECIAL INTEREST AT U. S. PORTS OF ENTRY

Some important interceptions that were reported December 31, 1961, by the Plant Quarantine Division, ARS, USDA, follow. These reports are based on identifications received from Federal taxonomists at the U. S. National Museum during the month, but do include any of special interest from recent months that were not previously reported.

A BRUCHID (*Bruchus dentipes* (Baudi)) in cargo of broadbeans destined for Illinois at Chicago, Illinois.

KHAPRA BEETLE (*Trogoderma granarium* Everts) 19 times; at New York, New York, 14 times; at Houston, Texas, 2 times; at Savannah, Georgia, one time; at Charleston, South Carolina, one time; and at Philadelphia, Pennsylvania, one time.

CITRUS BLACKFLY (*Aleurocanthus woglumi* Ashby) on leaves in cargo of limes for Texas at El Paso, Texas.

A WEEVIL (*Premnotrypes* sp.) in potatoes 5 times; at Miami, Florida, one time in baggage; at Wilmington, North Carolina, two times in stores; at Baltimore, Maryland, one time in stores; and at New York, New York, one time in crew baggage.

WHITE GARDEN SNAIL (*Theba pisana* (Muller)) 4 times on miscellaneous cargo destined for Virginia and Louisiana; at New Orleans, Louisiana, one time and at Norfolk, Virginia, 3 times.

A WEEVIL (*Lixus* sp., possibly *junci* (Boh.)) in beet stores at Philadelphia, Pennsylvania.

AN OLETHREUTID (*Grapholitha funebrana* (Treit.)) (or near this species) in baggage destined for Pennsylvania at New York, New York.

PEACH FRUIT MOTH (*Carposina niponensis* Wlsm.) once in baggage and 3 times in stores at Seattle, Washington.

A STENOMID (*Stenoma catenifer* Wlsm.) at Miami, Florida, 2 times in baggage; at Tampa, Florida, one time in stores; at Galveston, Texas, one time in stores; at Brownsville, Texas, 3 times in baggage; and at Hidalgo, Texas, one time in baggage.

CABBAGE MOTH (*Mamestra brassicae* (L.)) in stores at New York, New York.

SUMMARY OF INSECT CONDITIONS - 1961

(Continued from page 190)

TRUCK CROP INSECTS

General Truck Crop Insects

Highlights: CABBAGE LOOPER was abundant and required controls on crucifers in areas of Oregon; caused some damage to various crops in California, where it was active all year; was especially heavy on cabbage in the lower Rio Grande Valley of Texas; was again abundant and destructive in all areas of Maryland; received special attention in North Carolina; damage was moderate to severe on lettuce in Clark County, Nevada; and egg deposition on lettuce and infestations on cole crops were heavy during the fall in Arizona. YELLOW-STRIPED ARMYWORM was heavy on spinach in the Rio Grande Valley of Texas and caused some damage in Arizona, Utah and Maryland. Populations of WESTERN YELLOW-STRIPED ARMYWORM were heavy on lettuce in San Joaquin County, California. Several CUTWORMS were of local concern in California on a variety of crops. Several species of FLEA BEETLES were also of some concern generally in 1961. POTATO LEAFHOPPER populations became quite high on potatoes and beans in Wisconsin, with severe "hopperburn" on untreated acreages, and populations increased sharply during mid-July in Maryland, causing economic damage to beans and potatoes in all sections. The pest was also serious on potatoes throughout Ohio. GREEN PEACH APHID was destructively abundant on several crops in Ohio; seriously damaged sugar beets in an area of Washington; was a problem on several crops in Arizona early in the season and required controls on some crops during November and December; retarded growth of cabbage plants during February in Florida and was injurious to potatoes and tomatoes in that State about mid-January. APHIDS were generally damaging all year in California, being particularly serious on truck crops. LYGUS BUGS were heavy on cantaloup and moderate to heavy on potatoes in Nevada. LEAF MINERS were considered the number one pests of truck crops in Florida during the 1961 season. ONION THRIPS required controls in Nevada during July and August. THRIPS occurred on a large range of truck crops in California and were active all year. SPIDER MITES were of considerable concern in various areas. TWO-SPOTTED SPIDER MITE was one of the most damaging mites in California this season and infestations continued over most of the year. GARDEN SYMPHYLAN was important and caused damage to several crops in some sections of the Nation during 1961. BROWN GARDEN SNAIL was found for the first time in Oregon and Utah during the 1961 season.

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CABBAGE LOOPER (*Trichoplusia ni*) was abundant and required controls in crucifer plantings in Multnomah and Marion Counties, OREGON, from August through October 1. Light infestations of this noctuid developed early on many crops in CALIFORNIA. Populations varied considerably, geographically, and caused some damage to nearly all varieties of truck crops. The pest remained active in California until the end of the year. In NEVADA, cabbage looper infestations and damage ranged moderate to severe on lettuce in Clark County in the fall, and injury to cole crops in UTAH was nearly average for 1961. Cabbage looper eggs were found in low numbers on lettuce in COLORADO and timely control measures prevented any loss to this crop. Populations of the pest were very low on cabbage in the State this season and did not cause as much damage as in previous years. Light infestations of cabbage looper were present on lettuce from late February until harvest, and on melons in May and June in ARIZONA. Some damage to melons, caused by feeding marks on the rinds where melons touched the ground, was reported. Heavy egg deposition on fall lettuce created constant concern to farmers in central and southwestern areas during September and October, and heavy infestations of this pest occurred on cole crops in Arizona in late fall. Populations of cabbage looper had no opportunity to build up in lettuce fields in Dona Ana County, NEW MEXICO, as an adequate control program was initiated. Considerable damage to tomatoes, carrots and beans in gardens did occur, however, in the Las Cruces area.

Cabbage looper infestations were generally heavy on cabbage in the lower Rio Grande Valley of TEXAS, but were very light and practically nonexistent during the late 1961 season in ARKANSAS, where infestations were heavy in the late 1960 season. Populations of this pest in WISCONSIN increased in number in the late part of the 1961 season, as usual, and were more numerous at that time than during 1960. However, a disease severely decimated populations in early September. The first adult of the season was caught in the blacklight trap at Madison, Dane County, on July 6. Cabbage looper was abundant on cabbage and related crops in INDIANA during late August and September, and was of little importance in OHIO until October when it caused considerable damage to cauliflower and late cabbage. It was also rather common during the fall as a pest of greenhouse vegetables in Ohio.

Cabbage looper was abundant on vegetable crops in NORTH CAROLINA and received the attention of specialists and county workers. Moths were common in light trap catches on the Eastern Shore of VIRGINIA in late July, ranging 10-20 per night. Larvae were numerous on broccoli and other cole crops as well as fall cucumbers on the Eastern Shore. Weather conditions from August on were usually favorable for outbreaks which did not materialize. Frequent surveys and light trap collections established the fact that potentially severe outbreaks were in the making in this area, but were always curtailed by a nuclear polyhedrosis virus which was present in the field the entire season. Cabbage looper was again abundant and destructive to cole crops in all sections of MARYLAND during the 1961 season. Near harvest, controls were required for larval infestations on tomatoes in Worcester County. Cabbage looper appeared in moderate numbers in NEW JERSEY late in the season, but many were killed by a virus; and the pest was present in low populations throughout NEW HAMPSHIRE this year.

Damage by TOMATO FRUITWORM (*Heliothis zea*) was very low in UTAH during 1961, but late controls were necessary on this crop in most fields in COLORADO. Light infestations of tomato fruitworm were present on some fall lettuce in ARIZONA, and the pest infested a wide variety of crops in TEXAS during the season. Tomato fruitworm caused a limited amount of damage to truck and garden crops in OKLAHOMA and caused the least amount of damage in KANSAS that has been noted there in several years. The pest caused little damage to tomatoes in OHIO during 1961, and infestations on this crop in INDIANA were again relatively unimportant. Tomato fruitworm was rather common on snap beans in Sussex County, DELAWARE, during September, and on lima beans in most areas of the State late in the season. Light infestations occurred during September and early October in peppers and pumpkin-squash in Sussex County. The pest appeared to be generally under excellent control on tomatoes in areas of the State during this past season. Tomato fruitworm was occasionally encountered on tomatoes in VIRGINIA during the 1961 season, and infestations were light to moderate in GEORGIA, with most being moderate.

CORN EARWORM (*Heliothis zea*) attacked corn, lettuce, beans, peppers and tomatoes in CALIFORNIA during the 1961 season. Early, low populations remained at low levels until summer, when medium to heavy numbers developed in vegetable-growing areas of the State. This pest continued well into the winter this year.

YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) caused moderate damage to young spinach in Baltimore County, MARYLAND. Heavy populations of this noctuid attacked spinach in the Rio Grande Valley of TEXAS, and light to moderate infestations occurred on sugar beets and lettuce in ARIZONA during the late fall. Yellow-striped armyworm caused some local damage to tomatoes, beets and home gardens in northern and central areas of UTAH this year. WESTERN YELLOW-STRIPED ARMYWORM (Prodenia praefica) damaged a few fields of tomatoes and other vegetable crops in Utah, as well as damaging sugar beets in the Yakima Valley of WASHINGTON during September and October. Heavy populations of western yellow-striped armyworm were present in lettuce in the Tracy area of San Joaquin County, CALIFORNIA, this season. The peak of cycle of this pest in California occurred during the 1960 season and was followed by generally low populations in 1961.

Moderate numbers of BLACK CUTWORM (Agrotis ipsilon) caused moderate damage to tomatoes in the Orono area of Penobscot County, MAINE, during mid-July and larvae damaged lettuce and beet plantings in Benton County, OREGON, during early July. Black cutworm was heavy on sugar beets in the Chico-Durham area of Butte County and was locally damaging to radishes in San Diego County, CALIFORNIA. Infestations of VARIEGATED CUTWORM (Peridroma saucia) were medium on sugar beets locally in Orange County and locally heavy on celery in Santa Cruz County, California. Light populations of BEET ARMYWORM (Spodoptera exigua) occurred in the majority of the truck crop areas in California during the 1961 season, but heavy, local, spotted infestations were also present in many of these areas. RED-BACKED CUTWORM (Euxoa ochrogaster) was the only destructive cutworm species encountered during 1961 in ALASKA, the only infestation noted being north of Palmer in a vegetable garden. CUTWORMS were at the lowest ebb in years in ALASKA during 1961, with few requests being received for control information. Cutworms in general were active in almost every area of CALIFORNIA and generally light populations were present throughout the year. Damage by cutworms was generally moderate in UTAH during the spring and summer, and unidentified species caused slight loss in COLORADO by feeding on potato tubers late in the season. Cutworms constituted a problem in truck gardens in every area of TEXAS, and moderate to severe damage by these pests was reported in home gardens from many sections of NORTH DAKOTA during 1961. Cutworms were more numerous in WISCONSIN and less numerous than usual in CONNECTICUT this season.

Light infestations of a LEAF ROLLER (Platynota stultana) appeared on sugar beets and melons during the spring in ARIZONA. Medium populations of IMPORTED CABBAGEWORM (Pieris rapae) damaged cole crops in Los Angeles County, CALIFORNIA, and the pest was heavy locally on cole crops in San Diego County and heavy on celery in Monterey County. Also in California, populations of SALT-MARSH CATERPILLAR (Estigmene acrea) were light to medium on sugar beets, asparagus, lettuce and beans in various areas, but the pest was not as prevalent as in past years; and LESSER CORNSTALK BORER (Elasmopalpus lignosellus) caused light local damage to bean plantings in Orange County and medium damage to sweet corn in Corona, Riverside County.

Control of FLEA BEETLES on potatoes was a very important problem during 1961 in CONNECTICUT, but the pests were generally not commercially important on newly set vegetables in the State during the season. Phyllotreta spp. were heavy on cole crops during the spring and summer in MARYLAND, and overwintering Chaetocnema spp. caused some damage to tomatoes and potatoes on the Eastern Shore of VIRGINIA during May. Emergence of the second brood of Chaetocnema spp. on potatoes occurred around June 27 in Virginia, an event usually occurring about June 15. Flea beetles were quite numerous in broccoli plantings and on kale, collards and mustard during August in Virginia. Moderate to heavy populations of a flea beetle (Epitrix sp., probably parvula) occurred on peppers in the Lubbock area of TEXAS, and several species of flea beetles attacked a variety of crops in the State during the 1961 season. Undetermined species of flea beetles caused heavy damage to radish in Humboldt County, NEVADA, during June. Economic populations of another flea beetle (Phyllotreta cruciferae) appeared in fields of cabbage in Benton County, OREGON, on May 19, and undetermined species produced much spotting of leaves of turnips and radish in the Matanuska Valley of ALASKA early in the summer, but caused no serious damage. STRIPED FLEA BEETLE (Phyllotreta striolata) was generally moderate in vegetable gardens in UTAH during 1961, and severely injured some fields of potatoes in Garfield and Piute Counties and at other localities in the State. Populations of this flea beetle were about the same during 1961 as during 1960 in WYOMING. Some damage occurred to seedling sugar beets during May and June in that State and a few fields of beans were also damaged in Sheridan and Goshen Counties. Medium populations of TOBACCO FLEA BEETLE (Epitrix hirtipennis) were damaging to young tomato plantings in Butte County and the pest was light on asparagus and tomatoes in Yolo County, both in CALIFORNIA.

Low numbers of WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata undecimpunctata) appeared on foliage of potatoes in Clackamas County, OREGON, the week of May 15 and also attacked a variety of crops throughout the State. Fields of beans were damaged in Washington County from August 1 through harvest. In CALIFORNIA, adults and larvae of a CUCUMBER BEETLE (Diabrotica sp.) damaged spinach in Orange County, corn seedlings in Merced County, tomatoes in Glenn County, watermelons in Tehama and Yolo Counties, and were general pests in Marin County during the 1961 season.

ASIATIC GARDEN BEETLE (Autoserica castanea) was reported for the first time in NORTH CAROLINA during 1961, when specimens that had been collected while feeding on potato, bean and carrot on July 8, 1960, in Jackson County, were determined by O. L. Cartwright as this scarab. ROSE CHAFER (Macrodactylus subspinosus) populations and damage were moderate in beans in the China area of Kennebec County, MAINE, and moderate to heavy infestations occurred on strawberry and rhubarb in the Norway area of Oxford County. There were also 2 reports of rhubarb being infested by RHUBARB CURCULIO (Lixus concavus) in VIRGINIA during the 1961 season. VEGETABLE WEEVIL (Listroderes costirostris obliquus) caused severe damage locally to celery in San Diego County, and heavy damage to tomatoes in Sunnyvale, Santa Clara County, CALIFORNIA. BLISTER BEETLES were also of some concern during 1961. Meloe sp. attacked tomato plants during late August in RHODE ISLAND. Several species of blister beetles increased in abundance on many truck crops this season and were of special concern in home gardens in INDIANA; and several species caused some damage in gardens in OKLAHOMA, primarily in southeast and south central areas, but damaging populations did not occur as late in 1961 as during the 1960 season. Undetermined species of blister beetles caused localized damage to tomato plants in several areas of TEXAS and caused some damage to vegetables during May in Lea County, NEW MEXICO. WIREWORMS were more numerous in truck crops this season than usual in WISCONSIN, and required preplant trap crops or preventive treatment in Santa Barbara County, CALIFORNIA. These pests caused medium damage to melons in San Joaquin County and light damage to corn seedlings in Merced County, also in California.

POTATO LEAFHOPPER (Empoasca fabae) occurred in very light numbers during the 1961 season in COLORADO, with 4-12 per 100 sweeps on potatoes the highest number reported. Potato leafhopper averaged 2.5 per sweep in gardens in the Brookings area of Brookings County, SOUTH DAKOTA, and did not become seriously high during the 1961 season. Populations were moderate in the eastern portion of the State and some "hopperburn" was found on potatoes in Brookings County during the last week of July. Counts averaged 5 per sweep on potatoes in Hamlin County the first week of August. Populations of this pest remained at low levels generally in commercial potato fields throughout NORTH DAKOTA during 1961. Potato leafhopper was noted on potatoes in Waushara County, WISCONSIN, during the first week of June; and populations became quite high on potatoes and beans, with severe "hopperburn" on untreated acreages. Carrots, beets, peppers and eggplant were also infested, with lima beans heavily infested as late as mid-August in Jefferson County. Potato leafhopper was serious on potatoes throughout OHIO during 1961. Untreated plants averaged 11.6 nymphs per leaf, became heavily damaged by "hopperburn", and yield was reduced 50 percent.

Potato leafhopper populations in MARYLAND increased sharply in mid-July and caused economic injury to beans and potatoes in all sections. Largest numbers of potato leafhopper occurred on potatoes during the first half of June in DELAWARE, but the pest was generally not serious on this crop during the season. By late June, the pest was present on beans and peppers and, from mid-July to mid-August, was common on lima beans in most areas of Delaware. Potato leafhopper caused injury in untreated potato fields during late June and early July in southeastern PENNSYLVANIA, and adults and nymphs of the species were abundant in untreated potato fields in early August in RHODE ISLAND.

SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) was abundant in Franklin County, WASHINGTON, during June, and caused occasional damage to vegetable crops in local areas of UTAH during the 1961 season. Populations on potatoes in COLORADO early in the season indicated an increase, but the pest migrated north rather than west and very few were found on this crop later in the season. Very small numbers (0-1 per 100 sweeps) were present on lettuce in May in lettuce-growing areas and populations did not increase to economic levels. Trace numbers were present on tomatoes, but there were no reports of aster yellows or western yellow blight. Infestations of six-spotted leafhopper were mostly noneconomic in commercial potato fields in NORTH DAKOTA during the 1961 season. The pest was first reported in a light trap collection in MINNESOTA at St. Paul, Ramsey County, on April 28. Aster yellows were not a serious problem on truck crops in Minnesota during 1961. Six-spotted leafhopper was generally low in WISCONSIN in 1961, but infested carrot fields in the southeastern area the second week of June; and a commercial field of lettuce in Marquette County was treated for this pest during the first week of July. Populations were generally low in number in the State and only a few carried aster-yellows virus. Six-spotted leafhopper populations were below average in OHIO during 1961 and incidence of aster yellows in lettuce and carrots was very low. Populations were high on lettuce and carrots in NEW JERSEY this season and control was not good on the latter crop. Incidence of aster yellows was higher this year in this State. Moderate populations of six-spotted leafhopper caused light damage to lettuce in the Yarmouth-Portland area of Cumberland County, MAINE. Few plants showed signs of aster yellows by July 21. Aster yellows began to appear in Androscoggin and Sagadahoc Counties by July 28.

A complex of LEAFHOPPERS was heavy on vegetable crops in CONNECTICUT this season, especially on peppers and vinecrops, including cucumber, melons and summer and winter squash. Control of these pests on potatoes was usually no problem in the State, however. In COLORADO, an undetermined grass-feeding species of leafhopper damaged seedling beets in Sedgwick County, making it necessary to replant some fields. Leafhoppers became very numerous on raspberries in some areas of UTAH during 1961, and *Empoasca filamenta* caused occasional damage to vegetable crops in local areas of the State. Leafhoppers, in general, were abundant in CALIFORNIA during the 1961 season. Populations of these pests were medium on melons in Kern County; heavy on peppers in Orange County; light locally on beans, sugar beets and other truck crops in Monterey County; and light to medium on potatoes in Riverside and Tulare Counties. *E. filamenta* was unusually abundant and etiolated potato foliage in Kittitas Valley, Kittitas County, and near Quincy, Grant County, WASHINGTON, during August and September. Populations of undetermined species of leafhoppers continued rather light in ALASKA during 1961, but one species did cause light damage to lettuce north of Palmer early in the season. *E. filamenta* continued as one of the more numerous species on potatoes in Alaska, although damage appeared to be limited to the spotting of foliage along fields near the Matanuska Valley in the vicinity of Palmer.

Populations of various species of APHIDS continued rather light in ALASKA during the 1961 season. Aphids in general were damaging all year in CALIFORNIA and were particularly serious on truck crops. Light populations of these pests were present in all areas of the State, with spotted populations becoming heavy. Populations of aphids were normal or above on most vegetable crops in UTAH during the spring and summer. Light infestations of an APHID (Macrosiphum barri) occurred on some lettuce in the central area of ARIZONA during the spring and fall, and numerous aphid species were heavy on commercial and home vegetable crops throughout TEXAS during the year. Another APHID (Pemphigus sp.) was occasionally encountered on the roots of beans in VIRGINIA, and other APHIDS (Pentatrichopus spp.) were light to moderate on strawberries during November and December locally in Montgomery and Prince Georges Counties, MARYLAND. Aphid populations generally were not heavy on vegetable crops in NEW JERSEY during the season. Aphid populations were spotty and not so severe in CONNECTICUT as during 1960 and control on potatoes was generally not a problem.

GREEN PEACH APHID (Myzus persicae) was not severe in CONNECTICUT during the 1961 season, but populations increased to levels requiring control measures during the last week of July in RHODE ISLAND. There were a few instances of isolated infestations of green peach aphid on potatoes in NEW JERSEY, and the pest was first encountered on spinach in Sussex County, DELAWARE, in March, and on potatoes and peppers during May and June. Populations did not build up on potatoes in New Castle and Kent Counties until mid-July. From late July to early September, chemical control was necessary on peppers where green peach aphid populations tended to remain very high in most areas of Delaware. Several infestations also occurred on cabbage in Kent County. Green peach aphid was again generally light on peppers in Wicomico and Worcester Counties, MARYLAND, and light to moderate infestations occurred on young spinach in Baltimore County during the fall. This pest caused no commercial damage to the first crop of spinach on the Eastern Shore of VIRGINIA, but a few were present on fall spinach in that area. Green peach aphid was heavy on cabbage, and retarded plant growth in Alachua County and in the Belle Glade area of Palm Beach County, FLORIDA, during February. This aphid appeared at Homestead, Dade County, about mid-January, and increased to injurious proportions on potato and tomato. The pest was below normal on celery at Belle Glade on February 17. Populations decreased to numbers difficult to count by the first week of March. In Martin County, this species was reported to have increased on peppers and averaged 25-30 per leaflet at Belle Glade during the first week of March.

Green peach aphid was destructively abundant on radish, turnip, eggplant, pepper and potato in OHIO during the 1961 season, and was very common on potatoes this year in WISCONSIN, being very prevalent on this crop from the southern border of the State to Antigo, Langlade County. Populations were high in late August, with vines being killed in spots.

Green peach aphid infestations became very heavy on sugar beet in the central area of ARIZONA in mid-February. Populations remained high through March and most of April and were a problem on safflower, lettuce, carrot and potato, as well as sugar beet. Fall infestations of this aphid began increasing in late October and heavy infestations required controls on sugar beet, lettuce and carrot during November and December. Heavy infestations occurred during the spring and fall on turnip, Swiss chard, spinach, radish,pepper and eggplant. Green peach aphid was found to be developing in stored potatoes in Weld County, COLORADO, early in March. When conditions such as this occur, it can be expected that potato fields in the area may be infested early. In addition, cull piles can be a source of insects and diseases. Green peach aphid was found in low numbers in potatoes in June and increased slowly through July and August to a moderately high level in September, but numbers present were fewer than during the 1960 season. Controls were very effective during 1961, with populations of this aphid not increasing in fields where these controls were properly used. Green peach aphid infested seed potato fields in Fremont and Caribou Counties, IDAHO, during late July. By early August, populations were low on potatoes at the Tetonia Branch Experiment Station in Teton County. In Fremont County, population patterns in seed potato fields followed those of previous years, with heaviest infestations in fields nearest the town of Ashton where infestations were developed primarily from infested home vegetable and flower gardens within that town. Populations of the pest were generally lighter than usual in Butte and Custer Counties and considerably lighter in Caribou County. Summer forms of green peach aphid overwintered in the southern part of WASHINGTON and were abundant on native mustards in April. Populations did not build up to high levels on potatoes in the eastern area, except near Zillah, Yakima County, in mid-July. The aphid seriously damaged sugar beets near Zillah and was more abundant than usual on beets in Walla Walla, Walla Walla County. In CALIFORNIA, green peach aphid was medium on sweetpotatoes in San Bernardino County, heavy on potatoes in Santa Cruz County, and scattered, light infestations occurred in Kern County. Populations ranged light to heavy on tomatoes and peppers in Orange County, were heavy on sugar beets and tomatoes in Yolo County, medium on beans in San Diego County, and medium on spinach in Monterey County.

PEA APHID (Macrosiphum pisi) occurred in very light populations on truck crops generally over CALIFORNIA during the 1961 season.

Also in California, GROUND MEALYBUG (Rhizoecus falcifer) is proving to be a considerable problem in home gardens in Marin County, and varied populations of the pest are also present in the Stockton-Tracy area of San Joaquin County.

WHITEFLIES were very heavy in localized areas of CONNECTICUT during the 1961 season, particularly on tomato and summer squash, and GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) continued as the major pest of greenhouse tomatoes and cucumbers in OHIO this year. Heavy populations of whiteflies occurred on bean plantings in many locations over CALIFORNIA during 1961, and light populations occurred on carrots in the Coachella Valley in Riverside County.

TARNISHED PLANT BUG (Lygus lineolaris) populations and damage were moderate on asparagus in the Cape Elizabeth area of Cumberland County, MAINE, in late May and early June. This pest was present on a large variety of vegetable crops throughout most of the season from late March to early November in DELAWARE, being most abundant in areas of Sussex County from mid-July through August.

Several species of LYGUS BUGS (Lygus spp.) infested beans, carrots, potatoes tomatoes and asparagus to varying degrees over CALIFORNIA during the 1961 season. Heavy infestations of these pests developed on cantaloup in Churchill County, NEVADA, this season, and caused blossom drop and poor early fruit set. The pests were also heavy on potatoes in Eureka, Humboldt and Washoe Counties during July. In IDAHO, populations of Lygus elisus and L. desertus were generally lighter than usual in Butte and Custer Counties and considerably lighter in Caribou County. Lygus spp. were spotted throughout a number of truck gardens in the State during the season. Some late-season buildup on crops occurred in the southwestern area where lygus bugs, in one case, caused considerable damage to a field of beans near Caldwell, Canyon County. Lygus elisus and Lygus spp. were abundant on sugar beet seed crops in southern and northern areas of UTAH in the spring of 1961, but were controlled. L. elisus, L. hesperus, L. desertus and Lygus spp. were again abundant on seed beet crops in most areas of the State, resulting in poor quality of sugar beet seed wherever control in the bud stage was delayed or omitted. A FALSE CHINCH BUG (Nysius sp.) caused light damage to lettuce plantings in San Bernardino County and to watermelons in Fresno and Stanislaus Counties, CALIFORNIA. In TEXAS, one or more species of STINK BUGS attacked a wide variety of crops during the 1961 season.

Moderate populations of SPINACH LEAF MINER (Pegomya hyoscyami) caused moderate damage to spinach in the Orono area of Penobscot County, MAINE, in mid-June, and damage was severe to this same crop in the Yarmouth area of Cumberland County in mid-August. The pest was very common on beets in southeastern counties of WISCONSIN during August, destroying 20 percent of the leaf surface in some instances, and beet fields in Fond du Lac County were treated for spinach leaf miner about July 1.

LEAF MINERS were also of some concern in other areas during the 1961 season. They were considered the major pests of truck crops in FLORIDA during the year.

Control measures were inadequate in a number of cases and it was thought that reinfestations were accomplished by large populations in wild hosts. The population of leaf miners was extremely high during January, February and early March, but the pests apparently began to decline during mid-March due to an increase of parasites. Several species of leaf miners attacked a wide variety of crops in TEXAS during the season. Unusual leaf miner infestations in most of the greenhouse tomato plantings in northeastern OHIO were Liriomyza sp. In some greenhouses, injury was conspicuous on many tomato leaves, but there was a doubt if any measurable crop reduction occurred. An undetermined SERPENTINE LEAF MINER damaged bean foliage in Weld County, COLORADO, but no loss was observed. Agromyza spp. and Liriomyza spp. were exceptionally active on nearly all truck crops over CALIFORNIA during the season. Pegomya sp. was numerous in chard and beets in areas of the Kenai Peninsula and the Matanuska Valley of ALASKA during the 1961 season.

ONION THRIPS (Thrips tabaci) caused damage on dill by late July in the Twin Falls area of Twin Falls County, IDAHO, but was not a serious problem in OREGON during the 1961 season. Infestations of this thrips on truck crops varied from light to heavy in Lyon and Washoe Counties, NEVADA, in June, with heavy populations that developed during July and August in these counties requiring controls. Injury to onions by onion thrips was common and average in UTAH during the 1961 season, and the pest also occurred on many other crops in the State. This thrips appeared on onions during the latter part of June in COLORADO, but the use of controls kept populations at rather low levels throughout the season. In untreated fields, however, populations developed to the point that counts ranged 40-80 thrips per plant throughout the past season. In OHIO, onion thrips populations were unusually low during 1961.

FLOWER THRIPS (Frankliniella tritici) was reported on a wide variety of crops during 1961 in IDAHO, being particularly evident on carrot and onion seed fields in Canyon County during July, and damaged dill near Parmer, Canyon County, during the same period. In carrot seed fields, numbers averaged from 5 per umbel in the green-spiney stage to 18 per umbel in full bloom. In untreated onion seed fields, numbers ranged 10-60 per umbel on checks made July 7. By late July, damage from this thrips occurred on dill in the Twin Falls area of Twin Falls County.

Undetermined species of THRIPS were abundant on beans, cucumbers, onions and peppers in MARYLAND during 1961, and several species attacked a wide variety of crops in TEXAS during the season. Thrips began to increase on lettuce in NEW MEXICO during April but caused only minor damage to outer leaves. Populations were kept to a minimum in fields of Spanish onions in Dona Ana County by applying controls about every 10 days during June and July. Infestations of thrips (primarily Frankliniella occidentalis) averaging 2-4 thrips per lettuce plant were common during the spring in all areas of ARIZONA. Very heavy infestations of thrips were present in the blooms and terminal growth of melons, and medium populations occurred on some young onions in the State. In general, thrips were present on a large range of hosts and were active all year in CALIFORNIA. Heavy populations occurred on cabbage and truck crops in Imperial Valley, and were light to medium locally on pole beans in San Diego County; populations were locally medium on spinach and chili peppers in Orange County, damaged beans in Stanislaus County, and were light on onions in Siskiyou County; also light on beans in Colusa County. Also in California, F. occidentalis was light generally on truck crops in San Diego County; light on garlic and onions in Kern County; medium to heavy on truck crops locally in Santa Cruz County; and present, with apparently little damage, over most of the State. Thrips populations in Mesa County, COLORADO, caused extensive damage to cabbage during July, and often caused damage to beans in UTAH, especially in home gardens. A THRIPS (Taeniothrips orionis) continued to be damaging to cabbage plants in the Fairbanks area of ALASKA again this season, as well as being damaging to cucumber blossoms in this same area.

Also in Alaska, undetermined species of SPRINGTAILS continued to be a minor nuisance in early plantings of vegetables in cold, low-lying soils in the Matanuska and Tanana Valleys. These pests also damaged cabbage and carrots, as well as lettuce, in the State during the season. In CALIFORNIA, springtails were particularly damaging to bean seedlings in Santa Cruz County and damaged young tomato plantings in Yolo County. EUROPEAN EARWIG (*Forficula auricularia*) continued abundant in home gardens in many areas of IDAHO during 1961, where it has become one of the most annoying pests in gardens in the State. In CALIFORNIA, European earwig caused heavy damage to cucumber seedlings in San Joaquin County, was medium in artichoke gardens in Santa Cruz County, and was a definite pest in home gardens in many locations in the northern portion of the State.

There were very few occurrences of GRASSHOPPER damage to crops in CALIFORNIA this year, other than to home gardens; however, heavy populations of these pests did occur in carrots in Imperial County and were light in corn in Glenn County. A desert species was particularly damaging to new asparagus plantings in Coachella Valley, Riverside County. Also in California, heavy populations of FIELD CRICKETS (*Gryllus* spp.) occurred on truck crops in Imperial and Santa Clara Counties. In OKLAHOMA, several species of grasshoppers caused extensive damage to home gardens in many isolated localities throughout the State.

A heavy population of TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) caused severe damage in a 15-acre field of sugar beets near Neche, Pembina County, NORTH DAKOTA, and heavy infestations of this mite were common on raspberry in many communities in the State. Two-spotted spider mite often caused damage to beans in UTAH, especially in home gardens; and became extremely abundant on garden beans in the Boise area of Ada County, and in the Caldwell and Nampa areas of Canyon County, IDAHO, causing extensive damage during mid-August. Populations of this spider mite built up on hops in the Mount Angel district of Marion County, OREGON, during late July and reached extremely high levels on potato plantings near Portland, Multnomah County, where feeding caused wilting of foliage during the week of July 30. In WASHINGTON, two-spotted spider mite damaged potatoes at Quincy, Grant County, during July and August, and sporadic damage occurred in other eastern localities of the State, with sugar beets, mint and hops also being attacked. Heavy populations of this mite caused heavy damage to raspberries and also to strawberries in the western portion of Washington during late July. Two-spotted spider mite was one of the most damaging mites in CALIFORNIA this season, and infestations continued over most of the year. Populations were moderate on pole beans in San Diego County, heavy on sugar beets and beans in San Joaquin County, heavy on string beans in Orange and Butte Counties, and was a serious pest of gardens statewide.

BROWN WHEAT MITE (*Petrobia latens*) infestations on truck crops in NEVADA varied from light to heavy in Lyon and Washoe Counties during June.

SPIDER MITES were also of concern in several other areas during the 1961 season. *Tetranychus* spp. became serious on several plantings of cantaloup and watermelon in Wicomico County, MARYLAND; and undetermined species caused considerable injury to eggplants and beans on the Eastern Shore of VIRGINIA in August; and were numerous in all strawberry fields in that area during late April and early May. *Tetranychus* spp. were common on garden plants, particularly tomato, in north central, central and south central areas of OKLAHOMA during June and July, and various species of spider mites were a problem on commercial and home vegetable gardens throughout TEXAS. In ARIZONA, heavy infestations of *Tetranychus cinnabarinus* occurred on sugar beets in the spring and on melons in the spring and early summer of 1961.

GARDEN SYMPHYLAN (*Scutigerella immaculata*) caused considerable loss to fields of sugar beets in Weld County, COLORADO, and the pest attacked home gardens and occasionally commercial crops in scattered localities in northern and central areas of UTAH during the season. Garden symphylan continued to be one of the most important pests in OREGON during 1961, with losses reported in all irrigated areas. Damage to beet seedlings was extensive in Yamhill County, and rhubarb, beans and strawberries required replanting in the Willamette Valley. Garden symphylan damaged asparagus in the lower Yakima Valley of WASHINGTON during May and June, but attempted controls were unsatisfactory, with an average of 34.5 punctures per spear in plot samples.

BROWN GARDEN SNAIL (Helix aspersa) was collected for the first time in OREGON during 1961, and was found for the first time in UTAH during the season where it infested vegetables, as well as flowers and shrubs, in the Holladay area of Salt Lake County. SNAILS and SLUGS were not numerous in commercial vegetable fields in CONNECTICUT during the 1961 season.

Insects Attacking Solanaceous Crops

Highlights: Infestation of EUROPEAN CORN BORER in pepper pods approached 100 percent in New Castle County, Delaware, during September, and the pest was of considerable concern in this crop in southeastern Michigan this year. HORNWORMS were serious on tomatoes in South Dakota during early September, and very abundant on this crop in some areas of Indiana during July and again the first part of September. Medium to heavy populations of POTATO TUBERWORM occurred on potato plantings in several California counties. COLORADO POTATO BEETLE was moderate to heavy in southern Georgia; damaging throughout Texas; ranged light to heavy in south central and southeastern Oklahoma; adults were abundant in areas of Idaho; and the pest continued one of the most abundant species on potatoes in eastern Washington. POTATO FLEA BEETLE was a serious problem on potatoes throughout the 1961 season in Indiana. TOMATO RUSSET MITE ranged light to medium heavy on tomatoes from Santa Barbara County to Colusa County in California. PEPPER MAGGOT populations were relatively high in New Jersey.

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EUROPEAN CORN BORER (Ostrinia nubilalis) infestations in untreated peppers during late August and September averaged approximately 20 percent in Sussex County, DELAWARE, and several large fields of peppers in New Castle County approached 100-percent infestation of pods during September. Early infestations by first-generation borers during the first week of June, in young pepper plants, were noted in Sussex County; approximately one percent died. Infestations in potatoes were rather common in New Castle and Kent Counties during May and June, but were generally higher in several large fields in eastern Kent County. Larvae attacked eggplant generally. European corn borer entries in peppers were noted in Beaverdam, Worcester County, MARYLAND, on July 26, and some damage to peppers occurred in isolated plantings this season. Although a serious pest of peppers during 1961 in OHIO, European corn borer was seldom found on this crop during the 1961 season. However, the pest did cause considerable trouble on peppers in the southeastern portion of MICHIGAN this year, where two broods are more prevalent.

Larvae of TOMATO HORNWORM (Protoparce quinquemaculata) were observed damaging tomatoes in the Smithfield area of Providence County, RHODE ISLAND, in mid-August. Light infestations appeared in CALIFORNIA during July, and developed into medium populations through October from Colusa County to Santa Barbara County, but infestations were not as widespread as in 1960. Infestations of HORNWORMS (Protoparce spp.) were light to moderate on tomatoes in GEORGIA this season, although they were serious on this crop during 1960 in that State. TOBACCO HORNWORM (Protoparce sexta) and tomato hornworm were very abundant on tomatoes in some areas of INDIANA during July and again the first half of September. A majority of the larvae, approximately 90 percent, were tobacco hornworm, and parasitism of both species was highly erratic in Indiana this season. Tomato hornworm was quite a serious pest of tomatoes in SOUTH DAKOTA during early September, and damaging numbers of the species occurred in localized areas of TEXAS during the 1961 season. Hornworms were only a minor problem on tomatoes and chili peppers in Dona Ana, Luna, Sierra, Socorro and Lea Counties, NEW MEXICO. Controls for TOMATO FRUITWORM (Heliothis zea) were used early on tomatoes in COLORADO and tomato hornworm caused normal to above-normal damage to tomatoes and potatoes in UTAH this season.

Also in Utah, POTATO TUBERWORM (Gnorimoschema operculella) was rare in fields of potatoes in the southwestern area and absent in other areas of the State. Medium to heavy populations occurred in CALIFORNIA on potato plantings in Kern, Santa Barbara, Kings, Riverside, San Bernardino and Santa Cruz Counties, and damage was light to tomatoes in a few locations in the State this season. Potato tuberworm caused rather heavy damage to foliage of fall potatoes on the Eastern Shore of VIRGINIA in September and early October.

VARIEGATED CUTWORM (Peridroma saucia) was unusually numerous on potatoes on the Eastern Shore of Virginia, causing considerable damage to foliage. TOMATO PINWORM (Keiferia lycopersicella) populations were much below normal in CALIFORNIA during 1961 and TOBACCO BUDWORM (Heliothis virescens) infested a tomato planting in Redwood City, San Mateo County.

First COLORADO POTATO BEETLE (Leptinotarsa decemlineata) adults of the season in RHODE ISLAND began to appear about June 1, with first instars evident about June 15. Mature larvae were present on June 30, new adults by July 25, and second-generation eggs were first observed August 3. Seasonal populations of this beetle were unusually heavy in the State this year. Colorado potato beetle was of economic importance on potatoes in parts of several fields in CONNECTICUT for the first time in at least 15 years; and was present in abundance early in the season on potatoes and tomatoes in NEW JERSEY, with populations high and damaging in May. Colorado potato beetle was present on potatoes and tomatoes from early May to mid-July in DELAWARE, with large numbers occurring on potatoes only on small truck crop farms and home gardens. This beetle was also a pest in several areas of the State on tomatoes. Colorado potato beetle was light to moderate on commercial acreages of potatoes and tomatoes but heavy in many home gardens in MARYLAND this season; and caused some damage to tomatoes on the Eastern Shore of VIRGINIA, being extremely abundant in some areas of this section of the State. Two complete broods occurred on potatoes this year, which is unusual for the species in Virginia. The pest was moderate to heavy on potatoes in southern GEORGIA during 1961.

Colorado potato beetle was damaging throughout TEXAS during 1961, and populations ranged light to heavy on potatoes in south central and southeastern areas of OKLAHOMA during late May, the pest being common on many plants throughout June. Scattered populations of this beetle in the Red River Valley of NORTH DAKOTA were the highest in several years, but controls were effective in reducing damage in commercial fields. However, noneconomic populations persisted well into the summer in many localities in the area.

Light infestations of Colorado potato beetle occurred on potatoes in some areas of WYOMING during the 1961 season, but little damage was done and only limited controls were used. In UTAH, local damage occurred in Weber and Davis Counties and was also present in Kanab County. Adults of Colorado potato beetle were abundant on potatoes and egg deposition was common in Bingham and Bonneville Counties, IDAHO, during June. Light infestations occurred during July in seed potato fields in Caribou, Butte and Custer Counties, and by late July in potato fields in Madison, Jefferson and Fremont Counties. In August, populations of this beetle were very scattered throughout 300 acres in Blaine County, with spotted infestations also reported in Minidoka County. Colorado potato beetle continued to be one of the most abundant pests of potato plants in the eastern portion of WASHINGTON this past season.

POTATO FLEA BEETLE (Epitrix cucumeris) attacked potatoes over much of the southern part of MONTANA during 1961, and moderate adult infestations were present in commercial fields in the Red River Valley of NORTH DAKOTA early in June. Controls were initiated during the week of June 19 in some sections, and following completion of applications in the Red River Valley area, population levels were reduced to noneconomic levels until early August, at which time populations increased rapidly, causing severe damage in untreated fields. This flea beetle was common in potato fields in the eastern portion of SOUTH DAKOTA, with moderate leaf damage. Potato flea beetle was a serious problem on potatoes throughout the 1961 season in INDIANA. In the past, damage from adult feeding has been serious in the spring, but such feeding was also abundant this year during August and early September, and growers complained that beetles appeared to be more difficult to control by the usual chemical means. Populations of this potato pest were normal in OHIO except in a few areas where resistance to the chlorinated hydrocarbon insecticides is indicated.

Potato flea beetle was abundant and troublesome on potatoes and tomatoes in all sections of MARYLAND; was present on potatoes, but not in damaging numbers, in PENNSYLVANIA; and was numerous on potatoes and tomatoes late in the season in NEW JERSEY. Overwintering and new-generation adults of this flea beetle were unusually scarce in RHODE ISLAND during 1961. First adults were late in the State, emerging about the first week of June. In VERMONT, potato flea beetle was prevalent on potatoes and tomatoes.

TOBACCO FLEA BEETLE (Epitrix hirtipennis) was abundant and troublesome on potatoes and tomatoes in all sections of MARYLAND, and up to 8 per plant injured tomato transplants in Jackson County, OREGON, May 20. TUBER FLEA BEETLE (E. tuberis) adults were numerous on potato foliage May 16 in Clackamas County, Oregon, with resistance to recommended chemicals having apparently developed in one potato-growing area. Populations of this beetle were light to moderate in most potato-growing areas of COLORADO and did not require controls. Various FLEA BEETLES were abundant and of concern in NORTH CAROLINA. EGGPLANT FLEA BEETLE (E. fuscula) was destructive to eggplant in MARYLAND.

THREE-LINED POTATO BEETLE (Lema trilineata) adults were first observed on June 5 in RHODE ISLAND, with the seasonal population ranging light to moderate in most potato-growing areas in the vicinity of South Kingstown. Small numbers of the pest were swept from potatoes in most fields in the northwestern area of PENNSYLVANIA during the season.

MARGINED BLISTER BEETLE (Epicauta pestifera) attacked tomatoes during late July in RHODE ISLAND, and defoliated tomatoes and potatoes locally in VIRGINIA this season. Margined blister beetle and BLACK BLISTER BEETLE (E. pennsylvanica) were very numerous in fields of potatoes in northwestern PENNSYLVANIA during 1961, with large spots in fields completely defoliated, and infestations of a STRIPED BLISTER BEETLE (Epicauta sp.) were light on tomatoes in GEORGIA this season. Spotted infestations of ASH-GRAY BLISTER BEETLE (E. fabricii) occurred during late June on potatoes in the Idaho Falls area of Bonneville County, IDAHO, but feeding damage was generally minor.

PACIFIC COAST WIREWORM (Limonius canus) was collected at Winchester and Moses Lake in Grant County, WASHINGTON, during 1961, indicating that this species is gradually spreading into Columbia Basin irrigated areas. The pest damaged potato seed pieces and developing tubers at these locations. DARKLING BEETLES (Blapstinus spp. and Metoponium spp.) caused medium,early damage to tomato plantings in Yolo County, and PEPPER WEEVIL (Anthonomus eugenii) was light on chili peppers in Orange County, CALIFORNIA.

POTATO APHID (Macrosiphum euphorbiae) was first observed June 30 in RHODE ISLAND, with season populations remaining low during 1961, and populations of the pest were again light to moderate on commercial potato and tomato fields in MARYLAND. Potato aphid populations increased to a higher level in the San Luis Valley than in any other potato-growing area of COLORADO during 1961. In most cases, controls kept populations at low levels in the State, with the highest number, 5,000 per 100 leaves, being reported during August. Potato aphid was extremely rare throughout the potato seed growing area of southeastern IDAHO during 1961, and only trace populations of the pest occurred on tomato plantings locally in Orange County, CALIFORNIA.

Light infestations of POTATO PSYLLID (Paratrioza cockerelli) occurred on matrimonyvine and potatoes in the panhandle area of NEBRASKA from June through August, and surveys of matrimonyvine and potato cull piles in WYOMING during the last week of May and the first week of June indicated that heavy infestations of this pest might occur in that State during the 1961 season. However, a 2-week period of 90-100-degree temperatures during mid-June decreased populations to the extent that they did not become serious in Wyoming this year. Potato psyllid caused reduction of potato yield in some areas of COLORADO during this past season, but controls on tomatoes were applied early. Light infestations of potato psyllid were present on wild host plants (Lycium spp.) during early March in ARIZONA, and a few adults and eggs appeared on potatoes. Infestations were general throughout the central potato-growing areas of the State into May, but were very light in most cases. Medium infestations of this psyllid were present on some winter tomatoes in Yuma County. In MONTANA, a TREEHOPPER (Publilia modesta) was extremely abundant in fields of potatoes in Deer Lodge County during the 1961 season, but no damage was noted.

The incidence of PEPPER MAGGOT (Zonosemata electa) was the highest in NEW JERSEY during the 1961 season than it has been for a number of years. Also in New Jersey, a VINEGAR FLY (Drosophila melanogaster) was abundant on tomatoes late in the 1961 season. VINEGAR FLIES (Drosophila spp.) appeared much later in the season during 1961 than during 1960, and were not a serious problem around tomato canneries on the Eastern Shore of MARYLAND, and infestations on tomatoes were unusually light in the eastern portion of VIRGINIA this year. Drosophila spp. populations were normal in several tomato canning crop areas of OHIO in late September, and D. melanogaster was not a problem in tomato fields of INDIANA until the last of September, with populations becoming heavy in that State in October. Populations of this pest were moderate to occasionally high in tomato fields in UTAH in the fall of 1961. TOMATO RUSSET MITE (Aculus lycopersici) was not encountered on tomatoes in the State this season, but light to medium populations occurred on tomatoes in CALIFORNIA from Santa Barbara County to Colusa County. In TEXAS, considerable damage to tomatoes was caused by MOLE CRICKETS (Gryllotalpa spp.) in Brazos County.

Insects Attacking Cucurbits

Highlights: STRIPED CUCUMBER BEETLE infestations and damage were heavy in an area of Androscoggin County, Maine; populations were more abundant in Delaware than in 1960; adults were abundant and injurious on the Eastern Shore of Maryland; and the pest was more numerous in Indiana than in the past several years. SQUASH VINE BORER caused heavy injury in Maryland and was a problem in the Espanola Valley in New Mexico. SQUASH BUG caused considerable damage throughout Texas this season and was a problem on cantaloup in Valencia County, New Mexico.

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Heavy populations of STRIPED CUCUMBER BEETLE (Acalymma vittata) caused heavy damage to cucumbers and squash in the Auburn area of Androscoggin County, MAINE, during mid-June and also caused moderate damage to cucumbers in Orrington, Penobscot County, in late June. Light populations of this beetle caused moderate damage to cucumbers in the Kennebunkport-Wells area of York County in mid-July. Populations of this pest were average in VERMONT during 1961, but were lower than the previous few years in CONNECTICUT, with no cucumber wilt being observed in this State during the past season. Striped cucumber beetle was present in moderate numbers on cucumbers in NEW JERSEY, and populations were considerably more abundant in DELAWARE during 1961 than in 1960. Beginning in mid-May and continuing to late June, this pest was a serious problem on most young cucurbits in Delaware, particularly in southwestern Sussex County. Adults of striped cucumber beetle were abundant and injurious to foliage and flowers of cucumber and squash on the Eastern Shore and in central areas of MARYLAND, and was occasionally encountered on melons in VIRGINIA during the 1961 season. Striped cucumber beetle was definitely less numerous in most areas of OHIO this year; but was more numerous than in the past several years in INDIANA, where damage was severe throughout the State, caused mostly by adults feeding at the bases of stems in early June when the weather was cold. Striped cucumber beetle defoliated a commercial planting of cucumbers in Jefferson County, WISCONSIN, during the first week of July; however, this pest was not a major problem in most areas of the State. Local infestations of this beetle occurred on pumpkins in Lancaster County, NEBRASKA, and populations were moderately abundant on cucumbers during the latter part of the summer in SOUTH DAKOTA. Striped cucumber beetle caused moderate damage to susceptible crops in southern areas of UTAH this year.

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) also caused moderate damage to susceptible crops in southern portions of UTAH during 1961, as well as being moderately abundant on cucumbers during the latter part of the summer in SOUTH DAKOTA. Heavy populations of this beetle occurred on young watermelon plants in southeastern and northwestern OKLAHOMA during the 1961 season, and the pest was also common on truck crops in the southeast area of the State. The pest was rather abundant throughout INDIANA, with damage from feeding on cucurbits and some other vegetables being high. However, cucurbit wilt was not more abundant in Indiana than usual. Spotted cucumber beetle was more numerous on cucurbits on the Eastern Shore of VIRGINIA during 1961 than for several years, and numbers on cucurbits were moderate in NEW JERSEY this season.

FALL ARMYWORM (Laphygma frugiperda) caused moderate feeding injury to rinds of watermelon in Brooks County, GEORGIA. SQUASH VINE BORER (Melittia cucurbitae) was responsible for heavy injury to isolated plantings of squash and pumpkins in Anne Arundel, Howard and Montgomery Counties, MARYLAND, and was a serious problem on roots and vines of squash in the Espanola Valley in Rio Arriba County, NEW MEXICO, killing a majority of the plants attacked.

Populations of SQUASH BUG (Anasa tristis) were low during the 1961 season in CONNECTICUT, with low winter temperatures probably having been responsible for this situation. This coreid bug caused limited damage to truck and garden crops in OKLAHOMA this season, but was responsible for considerable damage to cucurbits throughout TEXAS. Squash bug was a problem on cantaloup fields in Valencia County, NEW MEXICO, during July, with treatments being effective only for short periods of time; and populations of this pest were above normal in Churchill County, NEVADA, from midsummer through the fall. Heavy infestations of MELON APHID (Aphis gossypii) also developed on cantaloup in this area of Nevada during June, and the pest caused about normal damage to cucumbers, squash and cantaloup in UTAH during 1961.

An EARWIG (Euborellia cincticollis) was fairly heavy on watermelons in Imperial County, CALIFORNIA, this year. Infestations of CUCUMBER BEETLES (Diabrotica spp.) were medium to heavy on cucumbers in Yavapai and Navajo Counties, ARIZONA, during the summer of 1961.

Insects Attacking Crucifers

Highlights: IMPORTED CABBAGEWORM was abundant and caused considerable damage to crucifers in several states, particularly in untreated plantings. CABBAGE APHID was abundant and required controls in Multnomah and Marion Counties, Oregon; was heavy during the winter months in Arizona; and was more numerous than in previous years in Wisconsin. RED TURNIP BEETLE was very destructive in the Kenny Lake area of the Cooper River Valley in Alaska. This is the first report of an insect problem in this area. CABBAGE SEEDPOD WEEVIL was reported for the first time in North Carolina during the 1961 season; this was also the first record of the pest in the eastern part of the Nation. HARLEQUIN BUG was heavy in scattered sections of Texas and was locally damaging throughout Oklahoma. CABBAGE MAGGOT caused losses in several states, with those in Multnomah County, Oregon, being the heaviest in several years. Resistance to chlorinated hydrocarbons by cabbage maggot was reported throughout central Washington. TURNIP MAGGOT continued as the most serious and consistent insect problem in Alaska.

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IMPORTED CABBAGEWORM (Pieris rapae) was abundant and required controls on crucifer plantings in Multnomah and Marion Counties, OREGON, from August through October 1 and injury by this pest was nearly average to cole crops in UTAH. Generally heavy infestations of imported cabbageworm occurred on cabbage in the lower Rio Grande Valley of TEXAS, but were light on that crop in southern GEORGIA and heavy locally on broccoli in Spalding County. The pest was observed in southern Dane County, WISCONSIN, on May 13, with egg laying noted on cabbage in Columbia, Dane and Jefferson Counties during the last week of June. Extensive leaf damage occurred on untreated garden plantings in the State. Imported cabbageworm was abundant on cabbage and related crops during late August and in September in INDIANA, and populations were unusually low in OHIO during the season. Populations were quite heavy on late cabbage during June and numerous on scattered cole crop plantings during late July in VIRGINIA, and were heavy on cole crops in all sections of MARYLAND by mid-June. Imported cabbageworm was abundant on cole crops in NEW JERSEY throughout the 1961 season; was moderately abundant in NEW HAMPSHIRE; and adults were observed in flight and mating in the Monmouth area of Kennebec County, MAINE, on May 23.

Injury by DIAMONDBACK MOTH (Plutella maculipennis) to cole crops was nearly average in UTAH during the 1961 season, and a few were observed in fields of cabbage in COLORADO, but no damage was reported this season. Light to moderate infestations of this pest occurred on cabbage in GEORGIA; heavy larval infestations developed on collards in the Painter area of Accomack County, VIRGINIA, and were numerous on scattered cole crops during late July. Larvae of EUROPEAN CORN BORER (Ostrinia nubilalis) attacked cabbage in various areas of DELAWARE during the 1961 season.

RED TURNIP BEETLE (Entomoscelis americana) was very destructive in the Kenny Lake area near Chitina in the Cooper River Valley of ALASKA. This is the first report of an insect problem in this area; all crucifers were heavily damaged. The pest was also destructive to broccoli and turnips in the Tanana Valley, but caused no trouble in the Eagle area during the 1961 season, although it was very destructive in this area during 1960. Heavy infestations of what probably was WESTERN POTATO FLEA BEETLE (Epitrix subcrinita) were present on crucifers in Multnomah County, OREGON, during July, and heavy populations of a FLEA BEETLE (probably Hemiglyptus basalis) occurred on broccoli plantings locally in Santa Cruz County, CALIFORNIA. Light to moderate infestations of PALE-STRIPED FLEA BEETLE (Systena blanda) occurred on turnips in the Griffin area of Spalding County, GEORGIA.

Adults of CABBAGE SEEDPOD WEEVIL (Ceutorhynchus assimilis) became active in the west central Clearwater River area of IDAHO in late April and began migrating into fields in that area. Infestations in host seed crops in the southwestern area of OREGON were generally below those levels noted in previous years. Cabbage seedpod weevil was reported for the first time from NORTH CAROLINA during the 1961 season. Specimens were collected on May 16, 1960, in Henderson County, when 1-2 adults per turnip plant were found, but determination by R. E. Warner was not made until 1961. This also constitutes a new record for the Eastern United States. Localized infestations of CABBAGE CURCULIO (Ceutorhynchus rapae) occurred on cabbage plantings in lower Northampton County, VIRGINIA, and light to heavy infestations of VEGETABLE WEEVIL (Listroderes costirostris obliquus) were present on foliage and roots of turnips in GEORGIA during the 1961 season.

CABBAGE APHID (Brevicoryne brassicae) was abundant on crucifer plantings in Multnomah and Marion Counties, OREGON, from August through October 1 and required controls; but populations were generally light on cole crops in coastal areas of CALIFORNIA this season. The pest was local, or minor, in importance on truck crops during the year in ARIZONA, but infestations were heavy on cole crops in the State throughout the winter months. Cabbage aphid was more numerous than in previous years in WISCONSIN and proved difficult to control. This aphid was noted in Kenosha and Walworth Counties in early June. A few isolated infestations of cabbage aphid occurred on late season cole crops in NEW JERSEY during the 1961 season, and local infestations in Baltimore County, MARYLAND, necessitated controls. Aphid infestations on kale and turnip greens in the State were also probably this species. Infestations of cabbage aphid ranged light to medium on cabbage in southern GEORGIA, but were generally lighter than in previous years. In OKLAHOMA, TURNIP APHID (Rhopalosiphum pseudobrassicae) caused a limited amount of damage to truck and garden crops in 1961, and HARLEQUIN BUG (Murgantia histrionica) caused some localized damage throughout the State. Harlequin bug was heavy on turnips, radishes and other crops in scattered sections of TEXAS during the season, and was present on cabbage during June and July in Pueblo and Adams Counties, COLORADO, where damage was light. Medium local populations of this pest developed on cabbage in San Joaquin County, CALIFORNIA.

Eggs of CABBAGE MAGGOT (Hylemya brassicae) were found in the Orono area of Penobscot County, and larvae in Bucksport, Hancock County, MAINE, by May 26. Damage from this pest was moderate to seed cabbage in Yarmouth, Cumberland County, and heavy to cabbage, cauliflower and broccoli in the Orono area early in June. Cabbage maggot was present in about usual numbers throughout NEW HAMPSHIRE and caused losses to several commercial growers in VERMONT, but adult populations were not very apparent in CONNECTICUT during the 1961 season. In NEW JERSEY, a moderate infestation occurred early in the season. Cabbage maggot caused locally heavy damage to cole crops in Santa Cruz County, CALIFORNIA, this season. This pest severely injured early cabbage, cauliflower, turnips and rutabagas in Multnomah County, OREGON, this season. Losses were the heaviest in several years in that State, with some plantings a total loss. Populations of this pest were moderate in western WASHINGTON, with heavy damage occurring to crucifers in June. Resistance to chlorinated hydrocarbons is now found throughout the central portion of western Washington. TURNIP MAGGOT (Hylemya floralis) continued to be the most serious and consistent insect problem in ALASKA again during 1961, and was destructive in all areas of the State in which crucifers can be grown.

Insects Attacking Beans and Peas

Highlights: MEXICAN BEAN BEETLE was found in Idaho for the second consecutive year within the area found infested during 1960, and was also found for the first time in the southwestern part of the State. This pest was reported for the first time in Kansas during 1961, and was damaging to beans in several other Eastern and Southern States during the year. PEA APHID was abundant on peas in areas of Idaho during June, and BEAN APHID was heavy on beans in areas of California and Washington. MITES also caused some damage to beans in California during the 1961 season.

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MEXICAN BEAN BEETLE (Epilachna varivestis) infestations were discovered in IDAHO for the second year. A single adult was collected June 9 in Jerome, Jerome County, within the area which had been infested during 1960. Eradicative measures were repeated again in 1961 on July 12, following the recognition of 6 additional infestations in the city. In mid-August, heavy infestations of all stages of the pest were noted in city gardens at Boise, Ada County. Surveys indicated scattered infestations throughout approximately a one-square-mile area in the northwest section of the city. This was the first instance of an infestation of this insect occurring in the southwestern part of Idaho and an eradicative program was organized there. Mexican bean beetle caused serious damage in a number of northern and central counties in UTAH, but was not a serious problem in WYOMING during the 1961 season. A few fields were moderately infested in Wyoming, but control measures were effective in keeping damage to a minimum. This pest appeared in bean fields in COLORADO the first week of June. Populations ranged light to medium in dry beans, but increased to 100-300 per 100 plants in some fields of snap beans during the latter part of July. Appearance in NEBRASKA was first noted on early beans in the panhandle area during mid-June. Mexican bean beetle was reported in KANSAS for the first time during the 1961 season and was the major truck crop insect in the State, being reported on beans in Johnson, Wyandotte and Leavenworth Counties; and was also damaging to bean plants in the western panhandle area of TEXAS. Infestations of Mexican bean beetle were light to heavy on beans in GEORGIA, being heavier this year than in previous years; but was about normal in abundance, generally, in OHIO. Mexican bean beetle was abundant in NORTH CAROLINA and populations were above normal in MARYLAND this season, causing considerable damage to beans in most sections of the State during July and August. In DELAWARE, the pest was generally more abundant this season than during 1960. Serious feeding injury was first noted on beans in eastern Sussex County during the first week of June and, by late June and throughout July and August, sporadic, heavy infestations occurred on lima beans, especially in Sussex County. Mexican bean beetle occurred in moderate numbers on beans in NEW JERSEY, with heaviest infestations late in the season. Season populations were very light in RHODE ISLAND, and the pest was again relatively scarce in NEW HAMPSHIRE, even in home gardens.

BEAN LEAF BEETLE (Cerotoma trifurcata) adults caused considerable foliage injury to beans in all sections of MARYLAND during 1961, and the pest heavily infested young beans during May and was unusually troublesome during the fall in VIRGINIA. Bean leaf beetle was abundant in NORTH CAROLINA, and infestations ranged light to heavy in GEORGIA, most being moderate. The pest caused minor damage to garden beans in eastern KANSAS this year.

Light populations of CUCUMBER BEETLES (Diabrotica spp.) were general on beans in Orange County, CALIFORNIA, and general controls for PEA WEEVIL (Bruchus pisorum) were applied to canning peas in UTAH following the above-average winter survival of this pest in that State. NUTTALL BLISTER BEETLE (Lytta nuttallii) damaged beans in a truck farm at Cut Bank, Glacier County, MONTANA, during late June. A SAP BEETLE (Meligethes nigrescens) appeared to be adversely affected by extremely high temperatures during July in OREGON, just as the species was increasing on beans in the Willamette Valley.

PEA APHID (Macrosiphum pisi) was present on peas in DELAWARE from late April to mid-June, with highest populations of 7-80 per sweep occurring in areas of Sussex County around late May and early June. Counts averaged 15-20 per sweep during the first half of June, and the pest was common in many fields in New Castle and Kent Counties. Alate forms of pea aphid migrated from alfalfa to

2-inch peas during the third week of May in WISCONSIN. Populations increased rapidly and reached a peak during the first week of June, at which time counts averaged 38, 8 and 130 per sweep in prebloom peas in the south central, east central and southwest areas, respectively. Field treatments began at this point, particularly in the southern part of the State. However, a sharp decrease in populations occurred during the next week and most treatment was stopped. Numbers remained low in Wisconsin until the last week of July, when they began to build up, and some treatment of late-planted peas was conducted. Injury to canning peas by pea aphid was again light in UTAH this season. The pest began moving into pea fields at lower elevations in the Lewiston area of Nez Perce County, IDAHO, during early May and, by early June, was particularly abundant on Austrian winter peas in the Clearwater River area. By June 30, exceedingly abundant populations of pea aphid occurred on peas in the Nezperce area of Lewis County, but they were below those reported during mid-June in that area. By late July, populations in pea fields in northern Idaho had decreased drastically due perhaps to predator pressures. By late August, some resurgence of population levels occurred, but these were confined to fields of alfalfa in the pea-growing areas of central Idaho.

BEAN APHID (Aphis fabae) was often damaging to beans in UTAH during 1961, especially in home gardens, and some heavy infestations of this pest occurred on beans in Clark County, WASHINGTON, by late July. First seasonal observance of bean aphid in OREGON was on June 26 at Stayton, Marion County, which is unusually early. Foliage damage to bush beans was reported from Multnomah County, but seasonal activity of this pest was reduced from previous years. Heavy populations of bean aphid developed on beans in the Chico area of Butte County and were medium on beans in the Chino area of San Bernardino County, CALIFORNIA. Populations varied light to heavy on beans generally in Orange County; were heavy on lima beans in Ventura County; and light to medium on beans in coastal Santa Barbara County. Also in California, heavy local populations of an APHID (Aphis craccivora) developed on beans in Orange County and were moderate on blackeye peas in the South Bay area and Pauma Valley in San Diego County.

GREEN STINK BUG (Acrosternum hilare) damaged various kinds of beans in numerous localities of VIRGINIA during the 1961 season. Apparently this bug carries a yeast which is injected into the beans and causes a spot on the developing bean, which results in a pithy-like appearance beneath the feeding puncture.

WESTERN BEAN CUTWORM (Loxagrotis albicosta) caused some damage to beans in IDAHO during the 1961 season in the Rupert area of Minidoka County, the Filer and Twin Falls areas of Twin Falls County, and in the Gooding area of Gooding County. This insect had caused virtually no damage to beans in the State during the 3-4 years prior to the current season. Two noctuids were of some concern to beans in CALIFORNIA this past season. BEAN LEAF SKELETONIZER (Autoplusia egena) was generally prevalent on lima bean plantings in Orange County, and CORN EARWORM (Heliothis zea) populations were general over the State. Although corn earworm was present in very light populations early in the year, the pest did not develop heavy populations until midsummer and then continued through the year. Light to medium local infestations of LIMA-BEAN POD BORER (Etiella zinckenella) occurred in lima bean plantings in Orange County, California. The pest was occasionally encountered on beans in VIRGINIA during 1961, and LESSER CORNSTALK BORER (Elasmopalpus lignosellus) heavily infested 2 fields of beans on the Eastern Shore of that State. EUROPEAN CORN BORER (Ostrinia nubilalis) larvae attacked beans in various areas of DELAWARE this past season, and larvae of COTTON SQUARE BORER (Strymon melinus) injured bean pods and plants in the Kingston area of Washington County, RHODE ISLAND, early in August.

SEED-CORN MAGGOT (Hylemya cilicrura) infested a 12-acre field of snap beans in James City County, VIRGINIA, and adults were extremely abundant on all kinds of plants throughout the State, with numerous reports being received from early May through the summer. Most specimens were dead when observed, having been killed by a fungus. PEA LEAF MINER (Liriomyza langei) was not a serious problem in OREGON during 1961.

BEAN THRIPS (Hercothrips fasciatus) severely damaged garden beans in Teton County, MONTANA, during the 1961 season, and GRASSHOPPERS caused considerable damage to bean fields adjacent to rangeland infestations in Dolores County, COLORADO. WHITEFLIES were general on bean plantings in many locations over CALIFORNIA, with several local infestations being heavy; and MITES required controls on beans in Tehama County, caused defoliation of this crop in Butte County, and damaged bean plantings in Sutter County. Also in California, medium, local populations of TWO-SPOTTED SPIDER MITE (Tetranychus telarius) damaged lima bean plantings in Irvine, Orange County; were heavy on beans in Butte County; and were light on this latter crop in coastal Santa Barbara County.

Insects Attacking Beets

Highlights: The BEET LEAFHOPPER survey in Washington indicated the overwintering population present in 1961 was one-fifth that present in 1960; and the potential population in southern Idaho was partially eliminated by early June due to desiccation of desert host plants. Curly top caused some damage to several crops in Utah. Heavy larval infestations of BEET WEBWORM were general throughout the Red River Valley in North Dakota and controls were applied to most acreages to protect the beet crop. Moth flights were heavy during June in the Red River Valley, both in North Dakota and Minnesota.

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The BEET LEAFHOPPER (Circulifer tenellus) survey in WASHINGTON indicated the overwintering population in 1961 to be about one-fifth that of 1960. The spring generation matured on mustard and adults appeared in beet fields during June. Up to 20 adults per square foot were present on wasteland and roadside plants in the Parma area of Canyon County, IDAHO, in early April, but, by early June, desert host plants had dried and eliminated part of the potential beet leafhopper population in the southern part of the State. In addition, approximately 15,000 acres were sprayed for beet leafhopper control during the spring of 1961. The incidence of curly top was very low in tomatoes, melons and other susceptible crops in CALIFORNIA. Beet leafhopper was responsible for some curly-top damage to sugar beets in UTAH, as well as to tomatoes, potatoes, beans, cucumbers, squash and other susceptible crops. This damage was light, however, when compared with that of 1958. Damage to early market tomatoes in the southern part of the State was higher. Beet leafhopper populations were light in COLORADO during the 1961 season, and losses due to curly top were 1-2 percent in Delta, Garfield, Mesa and Montrose Counties. Moderate numbers of this pest occurred in TEXAS this season, but there were few reports of curly top.

There were no reports of severe larval infestations of BEET WEBWORM (Loxostege sticticalis) reported in IDAHO during 1961, but adults were extremely abundant on the evenings of September 14-18 in the Parmer-Wilder area of Canyon County. Beet webworm populations caused less damage in WYOMING during the 1961 season than in 1960. A few sporadic infestations occurred in some fields of sugar beets in the State, but control efforts were highly successful. Beet webworm populations were moderate on sugar beets in COLORADO and controls were applied only in areas where populations were above average for the State. In some areas, numerous eggs were deposited on plants, but no larvae were produced and losses to sugar beets were at low levels. Eggs were found in very low numbers on lettuce and timely control applications prevented any loss. Beet webworm was present in small numbers in NEBRASKA during 1961, but greatly reduced from the population present in the panhandle area during the 1960 season. Heavy larval infestations of beet webworm were general throughout the Red River Valley in NORTH DAKOTA. Controls were applied to most acreages to protect the crop, with an estimated 60,000 acres being treated during the 1961 season. Season development observations showed moderate to heavy moth flights in many sections during the first week of June and oviposition was common in fields the week of June 12. Several larval infestations of this pyralid were noted week of June 19 and they rapidly reached outbreak proportions. Most beet webworm infestations in North Dakota were controlled by June 30; however, scattered populations requiring treatment continued to develop well into July. Beet webworm moth flights during June were moderate to heavy in the Red River Valley in MINNESOTA, but chemical control was excellent during 1961 and prevented damage in the State.

BEET ARMYWORM (*Spodoptera exigua*) larval infestations of 1-4 per 10 plants were present in some central ARIZONA lettuce fields in mid-September but were generally light. Light populations were a problem on some sugar beets in the State, and continued through October and November on lettuce. Early instars of ARMY CUTWORM (*Chorizagrotis auxiliaris*) ranged 2-20 per plant during early March in a small field of sugar beets in the ground over winter in Canyon County, IDAHO, and larvae were also reported causing damage to sugar beets in a field near Idaho Falls in early June, with damage estimated as heavy. DARK-SIDED CUTWORM (*Euxoa messoria*) damaged sugar beets in the panhandle area of NEBRASKA during the first week of June; and scattered infestations, probably BRONZED CUTWORM (*Nephelodes emmedonia*), occurred on sugar beets in northwest MINNESOTA in early June, with controls required in some fields.

PALE-STRIPED FLEA BEETLE (*Systena blanda*) damaged sugar beets in the Mitchell area of Scotts Bluff County, NEBRASKA, in early June, and caused some injury to sugar beets in Garfield County, COLORADO. In MONTANA, SPOTTED BLISTER BEETLE (*Epicauta maculata*) required controls on sugar beet fields in Dawson County.

Scattered, light infestations of SUGAR-BEET ROOT APHID (*Pemphigus betae*) were reported in several fields of sugar beets throughout the northern Red River Valley in NORTH DAKOTA, and a SUGAR-BEET ROOT APHID (*P. balsamiferae*) damaged a few fields of sugar beets in UTAH during the 1961 season.

SUGAR-BEET ROOT MAGGOT (*Tetanops myopaeformis*) caused considerable loss to sugar beets in Weld County, COLORADO, this season; and infestations in sugar beets were much lighter during 1961 in WYOMING, than in 1960, with only a very small amount of damage being found. Most infestations in Wyoming occurred in Washakie and Big Horn Counties.

Insects Attacking Onions

The ONION MAGGOT (*Hylemya antiqua*) population in NEW JERSEY was high during the 1961 season, but the pest caused very light damage to onions in OHIO, due largely to the widespread use of effective insecticides. Onion maggot was a problem in commercial onion fields in Jefferson and Racine Counties, WISCONSIN, this season. Adults were quite abundant in a Jefferson County planting during the third week of July and were a problem in northern areas of the State as well. Losses due to onion maggot, in green table onions, were high in Adams County, COLORADO, and considerable losses occured in green onions near Denver. Adults emerged during the first two weeks of April in Adams County, and increasing numbers were found present during the season. In August and September, the population of this pest reached a peak and, at harvest, onions were 25-100 percent infested. Onion maggot infestations were lower in most areas of NEVADA this season, except in Lyon County, where severe damage occurred. Infestations of this onion pest were again very minor in southwestern IDAHO during 1961. First adults of the season were observed on April 11 near Parma, Canyon County. Onion maggot was locally heavy on onions in Stanislaus County, CALIFORNIA. Populations were below normal in onion-growing areas of OREGON and were much lower than normal in the western portion of WASHINGTON this past season. Onion maggot was of little importance in ALASKA during 1961, except in onion sets in a few gardens in the Matanuska Valley.

ONION THRIPS (Thrips tabaci) was medium heavy on onions locally in San Joaquin County, CALIFORNIA, this season.

Insects Attacking Asparagus

ASPARAGUS BEETLE (Crioceris asparagi) and SPOTTED ASPARAGUS BEETLE (C. duodecimpunctata) populations were high in NEW JERSEY during the 1961 season, but both pests caused below normal damage to asparagus in northern and central counties of UTAH. Asparagus beetle was light, generally, throughout most of IDAHO during 1961, with moderate infestations noted on asparagus plantings at Burley, Cassia County, during early June. Asparagus beetle was occasionally encountered on asparagus in VIRGINIA this year, and populations were again about normal in MARYLAND on asparagus early in the season and on brush during the summer. All stages of this pest were noted on asparagus in the Esmond area of Providence County, RHODE ISLAND, in early June, and the beetle was prevalent in VERMONT this season.

BROWN WHEAT MITE (Petrobia latens) was light on asparagus in the southwest section of Orange County, CALIFORNIA, this season, and populations of a SPIDER MITE (Aplonobia myops) were light on this crop in the Bolsa area of the same county.

Insects Attacking Carrots

CARROT WEEVIL (Listronotus oregonensis) was present in moderate numbers during the 1961 season in NEW JERSEY, and the pest caused considerable injury to carrots in home gardens in Queen Annes County, MARYLAND. First CARROT BEETLE (Bothynus gibbosus) adults of the 1961 season in IDAHO were reported flying on April 28 in the Arena Valley near Parma, Canyon County. Adults were again reported abundant on August 1 in the Arena Valley, where counts ranged 1-3 per square yard, but no infestations were reported on crops in the area. Adults of carrot beetle were abundant in WASHINGTON at Pasco, Franklin County, and at Walla Walla, Walla Walla County, in August, but no damage was reported. CARROT RUST FLY (Psila rosea) populations were much lower than usual in the western area of Washington during the 1961 season.

Insects Attacking Mint

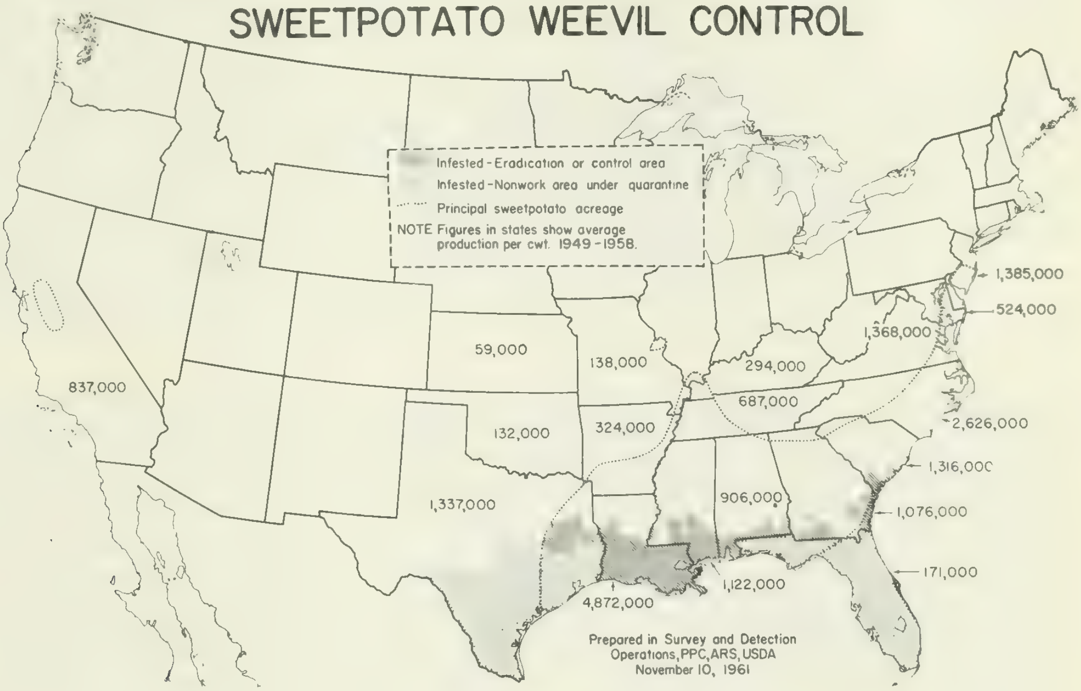
STRAWBERRY SPIDER MITE (Tetranychus atlanticus) populations increased on edges of mint fields in Jefferson County, OREGON, during late June, and required some controls during July; and undetermined species of CUTWORMS required control on mint fields in the Coberg area of Lane County, Oregon, by July 27. WEBWORMS and a PYRAUSTID (Pyrausta orphisalis) were abundant on mint in the Yakima Valley of WASHINGTON during August and September. CELERY LOOPER (Anagrapha falcifera) and another LOOPER (Autographa precationis) were collected in a light trap at the edge of a field of peppermint in INDIANA; and a NOCTUID (Rachiplusia ou) caused little damage to the mint crop in Indiana during the 1961 season.

Insects Attacking Sweetpotatoes

MORNING-GLORY LEAF MINER (Bedellia somnulentella) heavily infested several fields of sweetpotatoes near Townsend, Northampton County, VIRGINIA. Defoliation was almost complete and could have caused a drastic reduction in yield had the infestation occurred earlier in the season. In CALIFORNIA, this pest was responsible for light leaf mining in sweetpotato plantings in Los Angeles and San Diego

Counties. LEAF BEETLES (Metriona spp.) were rather heavy on sweetpotatoes on the Eastern Shore of VIRGINIA during June, and moderate, local infestations of SWEETPOTATO FLEA BEETLE (Chaetocnema confinis) occurred on newly set sweetpotato plants in GEORGIA this season. In NEW MEXICO, sweetpotato fields in Roosevelt County were damaged by ARGUS TORTOISE BEETLE (Chelymorpha cassidea) during late July and August. SOUTHERN POTATO WIREWORM (Conoderus falli) was reported to have caused damage to sweetpotatoes in the Lumberton area of NORTH CAROLINA for the first time.

SWEETPOTATO WEEVIL (Cylas formicarius elegantulus), an important pest of sweetpotatoes, is estimated to cause about 9 million dollars damage annually in the principal sweetpotato-producing states. The crop is valued at about 27 million dollars a year, and infested states have been spending $750,000 or more a year on weevil control. Grower expenditures in commercial areas have been high. The map below gives the status of the control program as of November 10, 1961.


SWEETPOTATO WEEVIL CONTROL
Infested-Eradication or control area
Infested-Nonwork area under quarantine
Principal sweetpotato acreage
NOTE Figures in states show average production per cwt. 1949-1958.
1,385,000
524,000
1,368,000
837,000
59,000
138,000
294,000
687,000
2,626,000
132,000
324,000
1,316,000
906,000
1,337,000
1,076,000
171,000
1,122,000
4,872,000

Prepared in Survey and Detection Operations, PPC, ARS, USDA November 10, 1961

Insects Attacking Hops

Larvae of HOP LOOPER (Hypena humuli) began appearing in hopyards in the Hermiston area of Umatilla County, OREGON, on July 1, and continued until harvest. Continuous flights of adults, sometimes exceeding 25 per night, were collected in a blacklight trap from June through August. HOP APHID (Phorodon humuli) appeared by May 14, which is early, in hopyards in the Willamette Valley of Oregon, and controls were generally applied in early June as populations increased. No further treatments were necessary.

Insects Attacking Small Berry Truck Crops

Highlights: Damage by STRAWBERRY CROWN MOTH was the heaviest in several years in Oregon, with most infestations in Washington County. RASPBERRY CROWN BORER was particularly heavy on raspberries during April in the Twin Falls area of Idaho. STRAWBERRY WEEVIL populations and damage were light to heavy in Maine, infestations were heavier during 1961 than 1960 in Arkansas, and the pest was moderate in all areas of Missouri in early June. Several WEEVILS were damaging to strawberries, raspberries and other cane fruits in Utah, Oregon and Montana. EUROPEAN FRUIT LECANIUM was severe on raspberry plantings in Canyon County, Idaho, during June, and RASPBERRY CANE MAGGOT caused heavy damage to raspberries at Placerville, California. TWO-SPOTTED SPIDER MITE infested strawberries in California almost continuously during the 1961 season.

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STRAWBERRY LEAF ROLLER (*Ancylis comptana fragariae*) appeared in moderate numbers in all areas of *MISSOURI* early in June, and adults were active in areas of Lancaster County, *NEBRASKA*, in April. Infestations of this pest in *KANSAS* were lighter than normal this season. STRAWBERRY CROWN MOTH (*Ramosia bibionipennis*) larvae damaged raspberries at Providence, Cache County, *UTAH*, and damage by this pest was the heaviest in several years in *OREGON*, with most infestations occurring in Washington County. Pupation occurred in late May in this State. RASPBERRY CROWN BORER (*Bembecia marginata*) was particularly heavy on raspberry plantings during April in the Twin Falls area of Twin Falls County, *IDAHO*, and the pest attacked raspberry plantings in Flathead and Missoula Counties, *MONTANA*, this season. ORANGE TORTRIX (*Argyrotaenia citrana*) required controls in some caneberry fields in the Willamette Valley of *OREGON*, and berry fields near Gresham, Multnomah County, were treated for this pest during the week of June 11. Inclement weather in Oregon prevented timely controls for OMNIVOROUS LEAF TIER (*Cnephasia longana*) in Washington and Multnomah Counties. Larvae of undetermined LEAF ROLLERS killed developing raspberry canes at Garden City, Rich County, *UTAH*, and were destructive during the spring growth period. A LEAF ROLLER (*Archips obsoletana*) was occasionally encountered on strawberries in *VIRGINIA* during the 1961 season, and caused heavy foliage injury to this crop in Frederick and Howard Counties, *MARYLAND*.

STRAWBERRY WEEVIL (*Anthonomus signatus*) was present in most strawberry-producing areas of *MAINE* during the season and infestations and damage ranged light to heavy. This weevil caused considerable damage to strawberry plantings at Glenn Dale, Prince Georges County, *MARYLAND*. Strawberry weevil appeared in moderate numbers in early June in all areas of *MISSOURI*, and infestations in *ARKANSAS* were heavier this season than during 1960.

BLACK VINE WEEVIL (*Brachyrhinus sulcatus*), STRAWBERRY ROOT WEEVIL (*B. ovatus*) and a WEEVIL (*B. rugosostriatus*) damaged many untreated strawberry patches in central and northern areas of *UTAH* during the 1961 season, as well as causing injury to raspberry roots and other canefruits. Another WEEVIL (*Nemocestes incomptus*) presented a new threat to strawberry production in Columbia County, *OREGON*, this year. Also in Oregon, a ROOT WEEVIL (*Sciopithes obscurus*) was present in above-average numbers in Multnomah County caneberries, and controls were necessary to prevent fruit contamination at harvest. Undetermined species of CROWN BORERS attacked strawberries in Prairie County, *MONTANA*, during the 1961 season, and STRAWBERRY ROOTWORM (*Paria fragariae*) killed nearly one-half acre of a large commercial planting during the fall of the year, which was the only injury reported or seen in the State.

EUROPEAN FRUIT LECANIUM (*Lecanium corni*) severely infested raspberry plantings at Caldwell, Canyon County, *IDAHO*, during June. Egg masses of MEADOW SPITTLEBUG (*Philaenus spumarius*) began appearing in strawberry fields in *OREGON* the week of April 9, and averaged one egg mass per plant in most fields in northern Marion County by May 10. A LYGAEID BUG (*Ozophora* sp.) caused moderate, local damage to strawberries in several northeastern counties of *TEXAS* during the 1961 season; and STRAWBERRY WHITEFLY (*Trialeurodes packardi*) became abundant on strawberries in Kingston, Washington County, and at East Greenwich, Kent County, *RHODE ISLAND*, after mid-August.

RASPBERRY CANE MAGGOT (Pegomya rubivora) caused heavy damage to raspberries at Placerville, El Dorado County, CALIFORNIA. Larvae of an undetermined species of CRANE FLY attacked strawberries in Hill County, MONTANA, during the 1961 season.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) infested strawberries almost continuously during the 1961 season in CALIFORNIA, with unusually high temperatures and drying winds causing severe damage before growers were aware of heavy infestations of this mite and too late to apply controls. Medium populations of EUROPEAN RED MITE (Panonychus ulmi) developed on strawberries during March in Santa Cruz County, California, and, because a great range of ornamentals was also attacked, control in commercial plantings was a problem until the occurrence of rain and cold weather in the area. Populations of undetermined SPIDER MITES were high and created a problem on fruiting raspberry and strawberry plantings in MINNESOTA, but controls were generally successful. Populations of spider mites were held back somewhat by a late spring in MARYLAND, but, by midsummer, populations were heavy on strawberries in all sections of the State. Several hundred acres of strawberries were treated for these pests during August in Wicomico and Somerset Counties.

CYCLAMEN MITE (Steneotarsonemus pallidus) was reported from scattered localities in MAINE during the 1961 season, with infestations and damage being moderate in Hancock County and generally light in other locales. In CALIFORNIA, cyclamen mite was of concern to strawberry growers in the Santa Maria area of Santa Barbara County and in the Santa Clara County area, and preventive treatments or controls were used in the Arlington area of Riverside County. Injury by ERIOPHYID MITES to berry crops in UTAH was generally light to normal this season, and undetermined MITES attacked strawberries in Chouteau County, MONTANA.

Insects Attacking Miscellaneous Truck Crops

Several misceallneous crops were damaged or infested in CALIFORNIA during the 1961 season. ARTICHOKE PLUME MOTH (Platyptilia carduidactyla) caused up tp 25 percent bud damage in San Mateo County and heavy losses in Santa Barbara and Monterey Counties. Heavy populations of a WEEVIL (Brachyrhinus cribricollis) became a problem in artichoke gardens in Santa Barbara County and locally in other artichoke-growing counties. Also in Santa Barbara County, light to medium populations of TWO-SPOTTED SPIDER MITE (Tetranychus telarius) developed on artichokes during the 1961 season. Infestations of an ACARID MITE (Tyrophagus dimidiatus) were light to medium on spinach in Orange County and light on this crop in Rancho Santa Fe, San Diego County. Infestations of ONION THRIPS (Thrips tabaci) were medium locally on spinach in Orange County, and an APHID (Anuraphis apiifolia) was unusually light in the celery-growing area of San Diego County.

TOBACCO INSECTS

Highlights: Tobacco pests, generally, were not serious during the 1961 season, although a few local problems did develop. HORNWORMS were important on this crop in southern Illinois during late June and caused light damage in some localities of Virginia. TOBACCO FLEA BEETLE was the most important pest attacking flue-cured tobacco in Virginia during 1961, and infestations of VEGETABLE WEEVIL in tobacco in plant beds ranged light to heavy in Georgia. Also, WIREWORMS caused moderate to heavy damage to transplanted tobacco in Georgia and North Carolina. Controls were required for GREEN PEACH APHID in a few areas of Maryland and Virginia. GRASSHOPPERS were heavy locally in Irwin County, Georgia, and caused noticeable injury in sections of Charles County, Maryland.

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HORNWORMS (*Protoparce* spp.) were important on tobacco in southern ILLINOIS during the last of June, at which time several growers in Jefferson County applied controls. In MARYLAND, these pests were again about normal in all districts, with damage to tobacco ranging from light to moderate. First and second broods were generally light in VIRGINIA; however, light damage occurred in some localities of that State. Hornworm infestations were light to moderate, but general, throughout tobacco-growing area of GEORGIA during the 1961 season.

Infestations of TOBACCO BUDWORM (*Heliothis virescens*) ranged light to moderate in GEORGIA during 1961, but were lighter than in 1960. This pest was abundant in NORTH CAROLINA during the season, receiving attention by specialists and county workers. BUDWORMS (*Heliothis* spp.) were unusually light during the season in Pittsylvania County, VIRGINIA, and populations were again rather low on tobacco in all districts of MARYLAND.

Infestations of BLACK CUTWORM (*Agrotis ipsilon*) necessitated some replanting of tobacco locally in Prince Georges County, MARYLAND, and *Agrotis* spp. damaged tobacco in some localities of VIRGINIA during 1961. The light infestations of CABBAGE LOOPER (*Trichoplusia ni*) occurring throughout the tobacco-growing area of GEORGIA during 1961 were lighter than those present in 1960. In VIRGINIA, EUROPEAN CORN BORER (*Ostrinia nubilalis*) and another PYRAUSTID (*Nomophila noctuella*) caused light damage to newly set tobacco at one locality in Caroline County.

During 1961, TOBACCO FLEA BEETLE (*Epitrix hirtipennis*) was the most important pest species attacking flue-cured tobacco in VIRGINIA. This beetle attacked all stages of growth in many localities and difficulty in control was often experienced. Tobacco flea beetle was about normal on field tobacco in MARYLAND during the season but was down considerably from 1960. The pest infested tobacco in the field in GEORGIA during 1961; and was abundant in NORTH CAROLINA, receiving special attention.

Infestations of VEGETABLE WEEVIL (*Listroderes costirostris obliquus*) ranged light to heavy in tobacco plant beds in GEORGIA, with most infestations being light to moderate. In MARYLAND, larvae of this pest were moderately injurious to tobacco in beds locally in Calvert County. Also in Maryland, larvae of GREEN JUNE BEETLE (*Cotinis nitida*) were responsible for uprooting plants in beds at Largo, Prince Georges County.

WIREWORMS (*Conoderus* spp.) caused moderate to heavy damage to transplanted tobacco throughout the tobacco-growing area of GEORGIA. Infestations were heavier in this area during 1961 than in recent years. In VIRGINIA, undetermined species of wireworms were damaging to tobacco in some localities. Wireworms were also abundant in NORTH CAROLINA this season. One grower near Tarboro, Edgecombe County, replanted tobacco three times because of wireworms and the failure of certain insecticides to accomplish control.

Populations of GREEN PEACH APHID (*Myzus persicae*) on maturing tobacco in MARYLAND required some controls, but were below normal. Controls were also required for this aphid in several sections of Pittsylvania County, VIRGINIA, and the pest was responsible for some damage in other counties of that State. In GEORGIA, infestations of green peach aphid were light to moderate during 1961.

Infestations of BROWN STINK BUG (*Euschistus servus*) and SOUTHERN GREEN STINK BUG (*Nezara viridula*) were light on tobacco in GEORGIA during the 1961 season.

TOBACCO THRIPS (*Frankliniella fusca*) heavily infested newly set field tobacco in some sections of Charlotte and Halifax Counties, VIRGINIA. Undetermined species of THRIPS were abundant and caused noticeable streaking of newly set tobacco in Calvert and Prince Georges Counties, MARYLAND.

Adult GRASSHOPPERS (Melanoplus spp.) caused noticeable injury to tobacco in sections of Charles County, MARYLAND, in August, and heavy, local infestations of undetermined grasshoppers were present on tobacco in Irwin County, GEORGIA.

COTTON INSECTS

Highlights: BOLL WEEVIL infestations were serious in southern and eastern areas of Texas and throughout Oklahoma. Severe damage was also reported in Florence area of South Carolina. Other reporting states indicated that infestations were well controlled or lighter than usual. BOLLWORMS were severe during the late summer and early fall on cotton in Arizona, and infestations were heavy in southern, and parts of eastern Texas. Bollworms were generally light or well controlled in other reporting states. PINK BOLLWORM inspections were negative for the year in the previously known infested states of Arkansas and Louisiana. Detection surveys were also negative in other surveyed southeastern states and in California and Nevada. Only occasional specimens were found in the eradication area of Arizona. Some controls for COTTON LEAF PERFORATOR and BEET ARMYWORM were required in Arizona, and the former species was heavy in parts of California. CUTWORMS were a problem locally in Georgia, Mississippi, Texas and California. LYGUS BUGS were damaging in western Texas and in areas of Arizona and California. THRIPS were troublesome and caused some damage to cotton early in the season in Georgia, Mississippi, Texas, New Mexico and Nevada. SPIDER MITES damaged cotton in several states; requiring some controls in Arizona, Mississippi, Missouri and California.

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BOLL WEEVIL (Anthonomus grandis) emergence in TEXAS was unusually late in the spring,due to dry weather; serious infestations occurred in the southern area and the eastern half of the State as unusually cool and wet weather persisted throughout July and early August. The weevil inflicted serious damage throughout OKLAHOMA, with infestations during 1961 being the heaviest in several years. The first infestations were recorded in late June and became common in cotton-producing areas by July 1. Infestations up to 80 percent of the squares punctured were reported in the southwest, with counts of 35-60 percent being generally observed. Counts remained high in most areas until harvest began. Late terminal growth, due to late summer rains, provided abundant food material until late in the season in Oklahoma. Overall populations in the State were considerably higher than in 1960. The percentage of infested fields in ARKANSAS was higher in early season, lower in midseason, then higher in late season, as compared with 1960. The percent punctured squares was lower throughout 1961 than in 1960, ranging from 1.8 to 18.6 from the first week of July to the first week of September, as compared with 0.6 to 21.3 between the second week in June to the first week in September in 1960. The percent of fields infested ranged from 11.7 to 95.9 from the first week of June to the first week in September in 1961. Boll weevil apparently has been little affected by predators and parasites in Arkansas. Consequently, special interest has developed regarding parasitism of larvae by several species of Hymenoptera. Most of the cotton-growing areas of MISSOURI had no trouble with boll weevil during 1961, due to the lack of hibernation quarters. However, near floodway ditches and other wooded areas where undergrowth is heavy, some weevils are able to survive the winter. During 1961, a gradual buildup of weevils occurred in cotton fields nearest these areas in Missouri and controls were needed near the end of the growing season.

Boll weevil survived the winter in larger numbers in MISSISSIPPI than for any of the past 4 years. Field infestations were generally light, however, due to the cool, late spring, late planting of cotton and, in some instances, heavy applications of controls on seedling cotton for cutworms. Farmers,in general, reported good to excellent control of weevils with little difficulty. As a result of unusual weather in ALABAMA, control of boll weevil was extremely difficult in many areas of that State. However, with the advent of good weather, this pest was kept well in check. The overwintered population in the Florence area of SOUTH CAROLINA and in surrounding areas was less in 1961 than in 1960; however, boll weevil did cause severe damage during the year. The main contributing factors were unfavorable weather at planting, excessive moisture during the growing period and inadequate number of control applications. Untreated cotton in experimental fields yielded 975 pounds, which compares with the 1945-1958 average of 952 pounds. Boll weevil was reported as abundant in NORTH CAROLINA.

A WEEVIL (Compsus auricephalus) was collected from cotton in the upper Arkansas River Valley of ARKANSAS. It was more numerous during 1961 than during 1960, but no economic infestations developed and no acreage was treated. PALE-STRIPED FLEA BEETLE (Systena blanda) and an unspecified flea beetle caused medium damage to seedling cotton in Clark County, NEVADA, during May. Populations and damage by pale-striped flea beetle were lighter than usual this season in Nevada. Systena spp. were present in ARIZONA, but of minor importance on cotton. Pale-striped flea beetle was not a problem during the year in MISSOURI. DARKLING BEETLES and a SCARAB (Cyclocephala dimidiata) were present in ARIZONA cotton, but of only minor importance.

Light but persistent infestations of BOLLWORMS (Heliothis spp., et al) threatened in ARIZONA during July, but they were generally held down by beneficial insects until mid-August when there was a sharp increase. Considerable damage occurred during the remainder of August, September and early October in Arizona when counts averaged 2-8 larvae per 100 plants in many untreated fields. Although chemical controls were generally effective, 1961 must be considered as one of the most serious of recent years in that State as far as bollworms are concerned. In CALIFORNIA, bollworms were low early in the year, but a fairly rapid buildup began during the early summer in Riverside and Imperial Counties. All cotton-growing areas of California experienced light to medium infestations from August until frost. A majority of the NEW MEXICO cotton fields received zero to one application during the season; only scattered bollworms were reported. Infestations and damage in NEVADA were heavy on 3 fields in Nye County during August, but populations were light for the remainder of the season in these and other fields. Bollworms were heavy in southern TEXAS and in areas in the eastern half of that State. The western and panhandle areas of Texas had the lightest damage in recent years, except for local instances of heavy infestations.

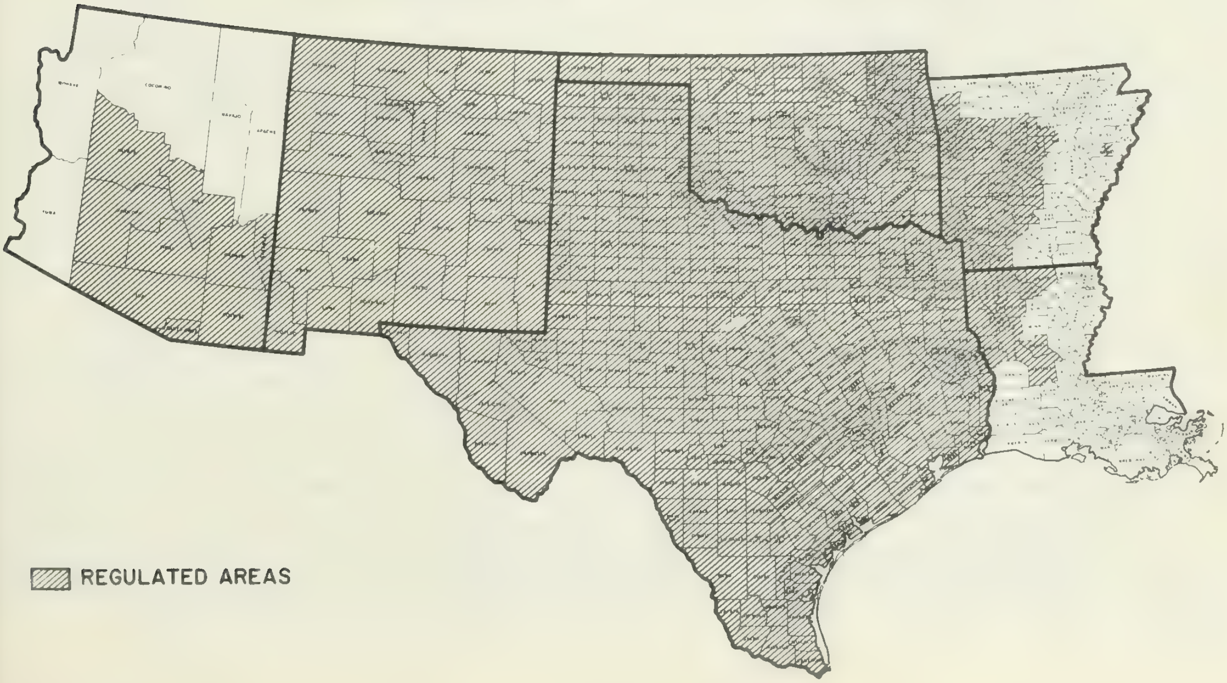
Bollworms began to build up to economic levels in most parts of OKLAHOMA by early August. Counts of 20-30 percent were noted in Grady County and were up to 60 percent by mid-August. This appeared to be a localized infestation, with counts elsewhere ranging 1-16 percent. By early September, populations were declining, with most activity noted in dryland cotton in the southwest. This appeared to be generally the same situation as in 1960, except for the Grady County area. In MISSOURI, bollworms were the lightest, generally, than they have been for some time. Early season infestations were scattered and very light. Populations began rising slowly about the last half of August and continued upward until plants were no longer attractive to moths. Some control was required just before the plants "cut out". Controls with chlorinated hydrocarbons were excellent. Fewer fields were infested with bollworms in ARKANSAS during 1961 than during 1960. The percent of fields infested ranged from 1.2 to 69.0 between the second week of June and the first week of September. Heliothis zea and H. virescens both infested cotton during 1961 in Arkansas, with H. zea being the most abundant. The most significant development regarding bollworms during 1961 in the State was the difficulty in obtaining control in a few areas. As a result, insecticidal resistance studies are underway.

Infestations of bollworms in MISSISSIPPI were generally light and spotty over the State. No general economic damage was reported. Light trap catches indicated little moth activity until very late in the season. Controls were applied to some fields, but most farmers applied controls on a preventive program. As a result of unusual weather in ALABAMA, control of first-generation bollworms was extremely difficult in many areas of that State. However, with the advent of good weather, controls kept infestations well in check. Trouble was encountered in only 2 areas of the State late in the season,but this was due to improper application of controls. Infestations in GEORGIA were lighter than in the previous 3 years. The first eggs were noted on May 18, which is later than 1958-60. The highest egg count of 112 per 100 terminals occurred on June 15. Counts in this range were common during 1960. Larval counts were lighter than in 1960. The highest larval count in 1961 was 28 per 100 terminals. Infestations of bollworms in the Florence area of SOUTH CAROLINA, and in surrounding areas, remained light and were not a problem throughout the growing season.

PINK BOLLWORM (*Pectinophora gossypiella*) occurred in very low numbers in TEXAS and was not a serious problem. Surveys in the previously known infested States of ARKANSAS and LOUISIANA were negative in 1961. In OKLAHOMA, gin trash inspections generally showed less than one larva per bushel of gin trash inspected. Higher counts (1.8-3.1 per bushel) were recorded only in Comanche, Jefferson and Stephens Counties in early season inspections. Lint cleaner inspections were negative for the western part of Oklahoma. Both gin trash and lint cleaner counts were lower than in 1960 in the State. Buildups of pink bollworm came late in the season in southern Dona Ana County, NEW MEXICO. Gin cleaner examinations in Eddy County of the same State indicated an apparent increase in populations.

PINK BOLLWORM REGULATED AREAS

— 1962 —



Only two pink bollworm moths were taken in Plant Pest Control Division light traps during the year in ARIZONA; one on March 20 in extreme eastern Yuma County, 6 miles north of Hyder, and one in southeastern Pima County, near wild thurberia plants. About 11,500 acres were treated in the central Arizona eradication program. Nine applications of insecticides were made at approximately 6-day intervals, beginning with the appearance of squares, on May 23 and ending July 23. Fall inspections have revealed only 3 infested fields in the eradication area. Two larvae were taken from gin trash originating 2 miles west of Stanfield, Pinal County, in mid-September; one larva from gin trash originating northeast of Mesa, Maricopa County, in early November and one larva from gin trash originating 3 miles north of Higley, Maricopa County, on December 8. A few fields in Graham County, which is not in the eradication area, were heavily infested and several fields had light infestations. During November, 1,300 larvae were taken from gin lint cleaners in Graham County and one larva was taken from a lint cleaner at Bowie, Cochise County. Surveys for pink bollworm in NEVADA during 1961 were negative.

COTTON SQUARE BORER (Strymon melinus) infestations occurred in central and eastern TEXAS; and an occasional larva of this species was found in cotton fields in Eddy and Chaves Counties, NEW MEXICO, but very little damage was noted. Light, scattered infestations of cotton square borer were no particular problem during 1961 in MISSOURI.

STALK BORER (Papaipema nebris) infestations in MISSOURI were light and scattered and caused no problem in 1961.

BEET ARMYWORM (Spodoptera exigua) infestations were light to medium in ARIZONA on young cotton in the central and southwestern areas from mid-April until late May. Control measures were required in many cases, with 50 percent of the plants showing feeding damage. Later infestations in older cotton were a problem in a few local areas in the central part of Arizona, but they were light from a statewide standpoint compared with previous years. Medium populations of beet armyworm developed locally in Imperial County, CALIFORNIA; other cotton areas of the State had light, spotted infestations.

CABBAGE LOOPER (Trichoplusia ni) infestations were not as heavy as in 1960 in GEORGIA and they were less severe on cotton in ARKANSAS. Economic infestations seldom occur on cotton in the latter State. The looper was not important during 1961 in MISSOURI. Cabbage looper was a major problem in only a few isolated instances in TEXAS and infestations were generally light throughout NEW MEXICO, with an occasional moderate to heavy infestation being reported. The pest caused localized defoliation in some isolated fields in south central OKLAHOMA. Infestations in ARIZONA increased to an average of 25-35 larvae per 100 sweeps in some cotton fields statewide by July 20. High populations continued in some areas of the State until about mid-August when a decline began, due to a disease of the larvae. Heavy populations of cabbage looper developed locally in Fresno County, CALIFORNIA; light to medium, spotted infestations developed late in most cotton areas of the State and developed into heavy populations which continued into the winter in Imperial County.

COTTON LEAFWORM (Alabama argillacea) was not a problem in TEXAS or MISSOURI.
COTTON LEAF PERFORATOR (Bucculatrix thurberiella) began to appear in ARIZONA in light numbers in Yuma County in mid-July. Most of the infestations were light and along the edges of fields until early August, when there was an increase in some areas of Yuma and Pinal Counties. Populations in these areas of Arizona remained high and required control measures in many fields until mid-September when there was a rapid decline. Cotton leaf perforator has been a problem in the desert cotton areas of CALIFORNIA in the past and is usually associated with stub cotton. Heavy populations of this pest developed in the Coachella and Palo Verde Valleys of Riverside County, and medium populations developed in the Borrego Valley of San Diego County, California, for the first time.

SALT-MARSH CATERPILLAR (Estigmene acrea) was fairly heavy to heavy in Imperial County, CALIFORNIA, and varied populations of the pest occurred in other cotton-growing areas of the State. Infestations were first noted in ARIZONA about August 20 in cotton in the central area. The buildup was very slow and migration occurred in only a few areas in late September. Although there were a few problem areas, 1961 was below normal for salt-marsh caterpillar in Arizona.

A LEAF ROLLER (Platynota stultana) was present, but of only minor importance on cotton in ARIZONA during 1961; but the leaf roller was variable on cotton in CALIFORNIA, being light in Riverside County, fairly heavy in Imperial County and heavy locally in Kern County. A NOCTUID (Acontia dacia) appeared in low numbers in TEXAS and did not become a problem.

GRANULATE CUTWORM (Feltia subterranea) infestations were moderate to heavy in several GEORGIA counties, but were not general over the State, and heavy populations of the cutworm were present in gin trash late in the year in Blythe, Riverside County, CALIFORNIA. An unidentified CUTWORM damaged 6 acres of cotton in Floyd County, GEORGIA. Several species of cutworms caused locally heavy damage to young cotton in southern TEXAS, and they caused slight reduction of stand in marginal rows in a few scattered fields in MISSOURI. Cutworms were a minor pest on cotton in ARIZONA during 1961. Cutworm infestations, primarily BLACK CUTWORM (Agrotis ipsilon)and VARIEGATED CUTWORM (Peridroma saucia), were heavy and caused serious localized damage to stands of seedling cotton in MISSISSIPPI. Infestations and damage decreased as the season progressed in that State. In CALIFORNIA, cutworms in general were medium to heavy on cotton in Riverside and Imperial Counties in May and June. ARMY CUTWORM (Chorizagrotis auxiliaris) was widespread over California in 1961, but populations remained exceptionally light and well scattered. Since this cutworm was little known in California prior to 1961, it may become a serious pest in the future. Larvae of a NOCTUID (Proxenus mindara), though not listed as a pest of cotton, were taken in large numbers from gin trash in Riverside and Imperial Counties, California, in November and December.

Medium to heavy populations of CELERY LEAF TIER (Udea rubigalis) developed very locally in Kern and Kings Counties, CALIFORNIA, and heavy populations developed in Riverside County on cotton. Medium to heavy populations of larvae were taken in gin trash in Riverside County until the end of the year.

COTTON APHID (Aphis gossypii) was light to moderate on seedling and late season cotton in GEORGIA, with late season infestations being generally lighter than in 1960. Infestations in ALABAMA were rather general in all cotton-growing areas of the State. Cotton aphid infestations in MISSISSIPPI were localized and often associated with fields of cotton treated on schedule with a material which was not effective for aphid control. Infestations were more numerous than during 1959 and 1960 in ARKANSAS, reversing a downward trend. However, infestations were noneconomic in that State in practically all instances. As prey for beneficial insects this pest was helpful, as beneficials were more abundant and preyed on bollworm eggs and larvae and on spider mites as well. Light infestations of cotton aphid in Arkansas occurred in 19-35 percent of the cotton fields from mid-June to early September, compared with 1-11 percent of the fields during 1960. During the early part of the season in MISSOURI, when the weather was cold and damp, moderately heavy populations of this pest occurred in many fields. With the appearance of warm weather, parasites and predators rapidly controlled cotton aphid. No other controls were necessary in Missouri. Light to medium cotton aphid infestations were observed in scattered areas of OKLAHOMA and infestations were generally light over TEXAS, but early, locally heavy infestations in certain areas of Texas caused considerable damage. Isolated instances of sooty mold on lint were reported in the west central section of the latter State. Populations in NEVADA were light throughout the season except during June, when moderate to heavy, spotted infestations occurred in Nye County. Cotton aphid and another APHID (Aphis sp., probably craccivora) were minor pests of cotton in ARIZONA,but cotton aphid became severe in several local areas in the cotton-growing counties of CALIFORNIA during the year.

Infestations of unspecified APHIDS in SOUTH CAROLINA were light on untreated seedling cotton at Florence and in surrounding areas during the year, but heavy infestations were prevalent in untreated fields in 1960. Infestations were light to heavy during July 1961 and control was necessary in some fields. Unseasonably cool nights and excessive moisture were the main contributing factors. Aphids were only minor pests of cotton in NEW MEXICO during 1961 and aphids in general were present in cotton-growing areas of CALIFORNIA, but developed late.

COTTON FLEAHOPPER (Psallus seriatus) infestations in MISSISSIPPI were light and no economic damage was reported. The dry spring in TEXAS forced this pest from wild hosts earlier than normal, but relatively wet conditions in the summer helped to prevent continued excessive damage to cotton in the State, and infestations were generally lighter than in 1960. Cotton fleahopper was only reported in OKLAHOMA. Light infestations were present on cotton in Yuma County, ARIZONA, during May and in all cotton-growing areas of the State during June and July. However, cotton fleahopper infestations were much lower than those of another fleahopper (Spanogonicus albofasciatus), but averaged 20 to 40 adults and nymphs per 100 sweeps in some fields. In NEW MEXICO, populations of both cotton fleahopper and S. albofasciatus remained relatively light in cotton-growing areas, with only occasional buildups. Very few fields of cotton were treated for these pests in the State.

Light populations of the FLEAHOPPER (Spanogonicus albofasciatus) were present on cotton during the seedling stage in ARIZONA and increased rapidly as cotton grew. Counts averaged 20-40 adults and nymphs per 100 sweeps on June 1 and 120 adults and 40 nymphs per 100 sweeps on June 10 in untreated cotton in the central area of the State. Infestations continued very heavy in Arizona until the decline began about June 20. Other cotton-growing areas of the State were less heavily infested, but the decline was later in the southeastern counties. In NEVADA, light to moderate numbers of the same fleahopper were present during the year, but the pest was controlled by insecticide treatments for other pests.

The principal species of PLANT BUGS in ARKANSAS were TARNISHED PLANT BUG (Lygus lineolaris), cotton fleahopper, Neurocolpus nubilus and RAPID PLANT BUG (Adelphocoris rapidus). The above-named plant bugs occurred in more cotton fields in Arkansas (20-58 percent) during the year than they did in 1960 (10-57 percent) at various times from mid-June to early September. In MISSOURI, the percentage of cotton fields infested with cotton fleahopper, tarnished plant bug and rapid plant bug reached a peak about the first of August. A few scouted fields in that State reached high enough infestations to justify controls; however, none were treated. Tarnished plant bug infestations in MISSISSIPPI were lighter than the previous 3 years; little economic damage was reported during 1961.

LYGUS BUGS (Lygus spp.) became a problem in local areas of TEXAS during the year. Migration of adult Lygus spp. in ARIZONA to cotton began in early June in the central area. This corresponded to the cutting of alfalfa hay in the area. Counts of 5 adults per 100 sweeps were common in cotton. Nymphs began to appear about June 20 in Arizona cotton, and, by July 10-15, heavy infestations averaging 20-40 adults and nymphs per 100 sweeps were present in many fields statewide. Infestations continued high in the State, with average counts of 20-50 percent punctured or damaged squares in many fields until cotton began to "cut out" in early September. Infestations remained high in untreated long-staple cotton throughout September. In NEVADA, populations of Lygus spp. increased to economic levels in Nye County in early July. Infestations in most fields were kept below economic levels by predators and parasites or by the use of insecticides, and damage was at a minimum except in a few fields where treatments were delayed or omitted. These pests were not a problem in Clark County, Nevada. Lygus spp. populations began early in CALIFORNIA, especially in the desert areas, and became medium to heavy in July. Populations continued into October. All cotton-growing areas of California experienced infestations, but there was a great variation in populations over the State.

SAY STINK BUG (Chlorochroa sayi) adult infestations were light to medium in some ARIZONA cotton fields throughout the summer. Most cases can be related to condition of other host crops nearby. The pest was more abundant in the higher elevations, but less important in the lower elevation areas of Arizona. Also in Arizona, light to medium infestations of Euschistus impictiventris adults occurred in some cotton fields throughout the summer. As with say stink bug, most infestations are related to the condition of the other host crops nearby. In CALIFORNIA, severe, local infestations of a STINK BUG (E. conspersus) occurred in Fresno County and heavy, general infestations of the pest were present in Imperial County.

A study of the species of LEAFHOPPERS found in ARKANSAS cotton was begun during 1961; 35 collections, representing 100 sweeps each, were made and specimens submitted for determination. In NEVADA, economic numbers of a LEAFHOPPER (Empoasca sp.) migrated into cotton from sugar beets being cut for harvest in late June in Clark County. Populations remained generally high through August and damage was severe in several cases, except in treated fields. Unspecified LEAFHOPPERS were present in many CALIFORNIA locations; fairly heavy populations required control in Imperial County. WHITEFLIES were present on cotton in CALIFORNIA, but they did not present the problem they did in 1960.

Light THRIPS infestations were observed in SOUTH CAROLINA at Florence and surrounding areas, and infestations were light to heavy on seedling cotton and heavier than in 1960 in GEORGIA. Thrips infestations in ARKANSAS occurred to a small extent and controls were applied to cotton in only a few cases. In many instances, however, thrips-like symptoms appeared on cotton in the State in absence of the pests. This, coupled with unfavorable growing conditions at the time, resulted in considerable use of insecticides needlessly. In MISSISSIPPI, infestations of Frankliniella spp. were heavy and general on much of the late-planted cotton. Serious ragging of leaves and stunting of plants were reported from untreated areas. Most infestations in the State were satisfactorily reduced or controlled where suitable materials were applied. Damage by several species of thrips in TEXAS was light to locally heavy in each section of the State. In NEW MEXICO, thrips, mostly Frankliniella occidentalis and F. gossypiana, caused curling of seedling cotton leaves throughout the cotton-growing areas of the State during May and June. Thrips infestations in ARIZONA were very light as cotton came up, but they did build up during several days of cool weather in mid-May. Average counts of 0.4 to 1 per plant were common and some fields required controls, especially in the southeastern counties and in Mohave County. Compared with other years, 1961 was a light thrips year in Arizona, particularly in the lower elevation areas. Infestations of Frankliniella sp. in NEVADA were generally light to medium, but some spotted, heavy damage occurred to seedling cotton in Nye County during May. Light to heavy populations of F. occidentalis occurred in cotton blossoms in all cotton areas of CALIFORNIA.

SPIDER MITES were rare at Florence, SOUTH CAROLINA, and in surrounding areas; only 2 spotty infestations were observed. DESERT SPIDER MITE (Tetranychus desertorum) ranged light to heavy in GEORGIA, mostly light to moderate. Spider mites caused some damage to cotton in the Tennessee Valley area of ALABAMA; however, damage was not as severe as in past years. Infestations of spider mites in ARKANSAS occurred in more fields than during 1960, following a decline which occurred in 1959 and 1960, compared with 1958. The percentage of fields infested in Arkansas ranged 1-30 percent compared with 1-10 percent in 1960. Marginal infestations of spider mites in MISSOURI, mainly STRAWBERRY SPIDER MITE (T. atlanticus) were present throughout the growing season. Spot treatment with some insecticides gave good control and usually prevented treatment of entire fields. A few entire fields were treated the last of August in Missouri. In MISSISSIPPI, infestations of TWO-SPOTTED SPIDER MITE (T. telarius), *T. cinnabarinus* and *T. lobosus* were erratic. Some localized areas required controls to prevent economic damage. *Tetranychus* spp. were reported on cotton in OKLAHOMA. Spider mites were generally light in TEXAS, but they were locally heavy in central and south central areas. Spider mites were of only minor importance in NEW MEXICO. Spider mites, primarily *T. cinnabarinus*, built up in some central ARIZONA areas in mid-July, requiring control measures in a few cases. Infestations continued as a problem in some areas of the State throughout the summer, but they were mostly local. Infestations and damage of *Tetranychus* spp. were moderate to heavy in Nye County, NEVADA, during May, June and September. Heavy infestations during September assisted in defoliating plants prior to harvest. MITES in general were very prevalent in CALIFORNIA. They appeared early in the season, but remained static until May when high temperatures caused a rapid buildup. Infestations of mites continued late in the fall in California. Cotton in Madera, Kern, Kings, Tulare, Merced and Imperial Counties experienced medium to heavy mite populations from June into October. Two-spotted spider mite was very prevalent on cotton in most areas of California and required considerable control.

SUMMARY OF INSECT CONDITIONS IN HAWAII - 1961
(Corrected)

Submitted by the Hawaiian
Entomological Society

Highlights: There were several important developments that took place during the year, particularly with respect to the discovery of 5 new insect pests of major importance. Increased activity by CATTLE GRUBS was reported by ranches on Hawaii and Molokai, and on Kauai NORTHERN CATTLE GRUB was reported for the first time. Moderate to heavy infestations on showertrees on windward Oahu by a twig-boring OLETHREUTID MOTH were noted. Light damage by ARMYWORM to range grasses was observed on Kauai and Hawaii, while on Oahu heavy damage to grass by a LAWN GRASS ARMYWORM was reported in Aina Haina and Manoa Valley. A new infestation of an AFRICAN SNAIL (Achatina fulica) was found at Poipu, Kauai, after several snail-free years. Introduced BENEFICIAL INSECTS continued to exert heavy stress on some weed and insect pests. A promising PARASITIC BRACONID WASP of armyworm was recovered on Hawaii for the first time.

Cereal and Forage Insects: Damage to lawn grass (Zoysia spp.) by a new immigrant BILLBUG (Sphenophorus venatus vestitus) was observed for the first time in Waipahu, Oahu. An upsurge of a LAWN GRASS ARMYWORM (Spodoptera mauritia acronyctoides) in the Kailua-Kaneohe, Aina Haina and Manoa localities was also observed. A DELPHACID PLANTHOPPER (Chloriona kolophron), a known pest of rice in Fiji, was found established in Oahu in 1961. A GEOMETRID MOTH (Anacamptodes fragilaria) caused moderate to heavy damage to alfalfa on Maui, a new State host record for this pest. Larvae of a new leaf-folding GELECHIID MOTH (Dichomeris sp.) were found damaging alfalfa at Ewa. Also damaging to this host were outbreaks of BLACK CUTWORM (Agrotis ipsilon) at Kualoa and Mokuleia Ranches, Oahu. A GRASSHOPPER (Atractomorpha ambigua) appeared in great numbers throughout the summer and fall on kikuyugrass (Pennisetum clandestinum) and caused light to moderate damage to cabbage and bean crops on Kauai Island. RUSTY PLUM APHID (Hysteroneura setariae), a vector of sugarcane mosaic, pest of sorghum and other crops, was found established on Oahu and Molokai for the first time.

Forest, Ornamental and Shade Tree Insects: An APHID (Cinara sp.) was collected on loblolly pine (Pinus taeda) seedlings at Olinda, Maui, and serious damage to saplings was subsequently observed. According to Dr. F. C. Hottes, specialist, this may be a new species. A twig-boring BARK BEETLE (Xyleborus morstatti), a serious pest of coffee, was discovered damaging twigs of pink tecoma (Tabebuia pallida) in Kailua, Oahu. It is widely distributed in tropical Africa, Madagascar, India, Fiji, Indonesia and other countries where it is reported on coffee, avocado, mango, cacao, mahogany, coca, elderberry and other plants. Locally, it has been recorded from Vitex trifolia, Hibiscus sp., Jasminum sp., J. pubescens, J. sambac, Vinca sp., Eugenia uniflora, Eranthemum eldorado, Pittosporum tobira and Tabebuia pallida. This is the first record of this pest in Hawaii and thus far it appears to be confined to Oahu. Another BARK BEETLE (Hypocryphalus mangiferae) was observed damaging live mango branches in Kaimuki, Oahu. It has been reported damaging live mango branches in India, but only occasional infestations have been reported locally. Seasonal ravages of a twig, seed and fruit-boring OLETHREUTID (Cryptophlebia ombrodelta) came into focus during March and April when terminals of rainbow showertrees on windward Oahu, were attacked. A native species, KOA SEEDWORM (C. illepida), was reported causing light damage to macadamia nuts at Honokaa, Keeau and Kona, Hawaii. A KOU MOTH (Ethmia colonella) was reported for the first time from Kauai, where it was defoliating kou (Cordia subcordata). A NOCTUID (Achaea janata) was active on castorbean (Ricinus communis) at Kailua, Oahu, and on Hawaii and Maui during the latter part of 1961. There were numerous reports of damage to ornamental croton by this pest. Light infestations of another NOCTUID (Polydesma umbricola) on monkeypod (Samanea saman) were reported from Kauai and Hawaii.

Truck Crop Insects: SOUTHERN GREEN STINK BUG (*Nezara viridula*) was discovered in Manoa Valley, Oahu, in September, and constitutes a new record for Hawaii. Attempts to eradicate *N. viridula* were abandoned when it was learned that it had spread to other localities. A number of hosts have been recorded, but it is commonly found on soybeans and other legume crops. The first outbreak of a TARO LEAFHOPPER (*Tarophagus proserpina*) was reported at Waimea Valley, Kauai, causing light to moderate damage on 7-10 acres of taro (*Colocasia antiquorum*). An efficient egg-sucking predator, a PLANT BUG (*Cyrtorhinus fulvus*), appeared in great numbers and brought about effective control.

Insects Affecting Man and Animals: Increased activity of NORTHERN CATTLE GRUB (*Hypoderma bovis*) was reported from Hawaii where attacking flies caused cattle to knock down fences on Puu Oo Ranch. This species was also active on Molokai and was reported from Kauai for the first time.

Beneficial Insects: Incessant defoliation of lantana (*Lantana camara* var. *aculeata*), a noxious weed pest, by introduced NOCTUIDS (*Hypena strigata* and *Catabena esula*), a PYRAUSTID (*Syngamia haemorrhoidalis*) and LANTANA LACE BUG (*Teleonemia scrupulosa*) caused dieback of many plants to ground level in Kau and North Kona, Hawaii, and at Keokea and Ulupalakua, Maui, during 1961. A destructive stem and root-boring CERAMBYCID BEETLE (*Plagiohammus spinipennis*) was very active in Kona and Kau, Hawaii, and its establishment appears likely. A PARASITIC BRACONID WASP (*Apanteles militaris*), introduced from California in 1960, was recovered for the first time from armyworm (*Pseudaletia unipuncta*) at Kamuela, Hawaii. Good progress in the control of sourbush (*Pluchea odorata*) by a seed feeding TEPHRITID FLY (*Acinia fucata*) was noted on Oahu, Kauai and Maui. Another PARASITIC BRACONID WASP (*Aphidius smithi*), introduced in late 1960 for the control of pea aphid (*Macrosiphum pisi*) was recovered a month after release at Ewa, Oahu. It has been released and recovered in Kauai and Maui. Field collected aphids from these localities were heavily parasitized by this beneficial wasp. Excellent control of emex (*Emex australis*) by a leaf-feeding and stem-boring WEEVIL (*Apion antiquum*), introduced from South Africa in 1957, was observed at the Parker Ranch, Hawaii. Releases on Maui and Oahu have become established and are beginning to spread.

Miscellaneous Pests: An AFRICAN SNAIL (*Achatina fulica*), a pest of succulent vegetable crops and various ornamental and fruit trees, appears to have been eradicated from the Island of Hawaii. However, this was offset by the discovery of a colony at Poipu, Island of Kauai, which, until this discovery, was considered snail free. GERMAN COCKROACH (*Blattella germanica*) was a very troublesome household pest during 1961 and numerous complaints were received. Although resistance to some insecticides by this pest is a matter of record, reasons for this upsurge in activity were not ascertained locally.

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